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Ontario Geological Survey
Open File Report 6113

Report of Activities, 2002 Resident Geologist Program

Timmins Regional Resident Geologist Report: Timmins and Sault Ste. Marie Districts

2003

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ONTARIO GEOLOGICAL SURVEY

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Timmins and Sault Ste. Marie Districts

by

B.T. Atkinson, M. Hailstone, G. Wm. Seim, A.C. Wilson, D.M. Draper, D. Farrow, P. Hope and A.M. Koroschetz

2003

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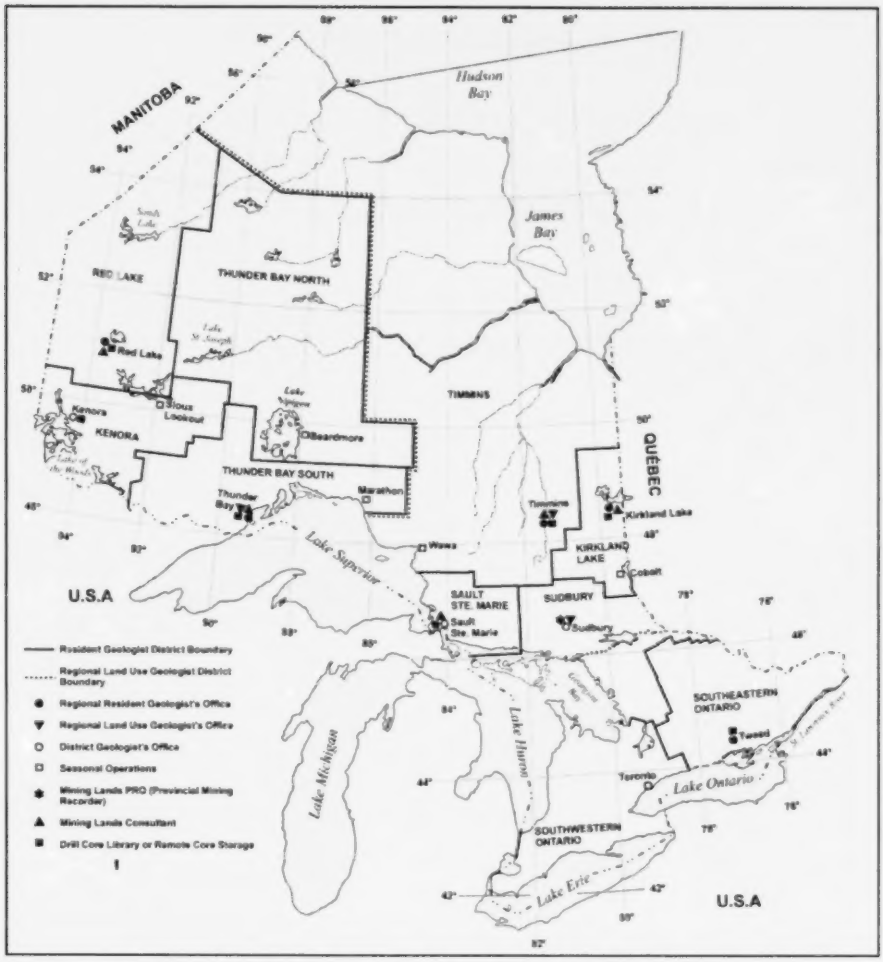

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ONTARIO GEOLOGICAL SURVEY

RESIDENT GEOLOGIST PROGRAM

REPORT OF ACTIVITIES - 2002

TIMMINS REGIONAL RESIDENT GEOLOGIST REPORT

CONTENTS

1. Timmins District

2. Sault Ste. Marie District

Ontario

Ontario Geological Survey
Regional Resident Geologist's Program

Timmins Regional Resident Geologist (Timmins District)–2002

by

B.T. Atkinson, G. Wm. Seim, A.C. Wilson, D.M. Draper, P. Hope and A.M. Koroschetz

2003

CONTENTS

Timmins Regional Resident Geologist District—2002

INTRODUCTION 1
MINING ACTIVITY 10
Base Metal Mining 11
Falconbridge Limited – Kidd Creek Mine 11
Gold Mining 12
Porcupine Joint Venture Kinross Gold Corporation – Hoyle Pond Mine 12
Porcupine Joint Venture Placer Dome (CLA) Limited – Dome Mine 12
River Gold Mines Ltd. – Eagle River Mine 13
River Gold Mines Ltd. – Mishi Pit 13
Industrial Mineral Production 14
Agrium Inc. – Kapuskasing Phosphate Operations 14
Great White Minerals Ltd. – Fripp Silica Quarry 16
Luzenac Inc. – Penhorwood Mine 16
Roseval Silica Inc. – Penhorwood Silica Quarry 16
ADVANCED EXPLORATION 16
De Beers Canada Exploration Inc. – Victor Diamond Project 16
Falconbridge Limited – Montcalm Ni-Cu Project 20
Northcott Gold Inc. – Davidson Tisdale Mine 20
Northville Gold Corporation, Condor Gold Corp. – Young Shannon Mine 21
EXPLORATION ACTIVITY 21
Arctic Star Diamond Corp. / Iciena Ventures Inc. / Oasis Diamond Exploration Inc. – Enigma Property 21
Band-Ore Resources Ltd. and Kennecott Canada Exploration Inc. – GQ Property 21
Big Red Diamond Company (1387197 Ontario Inc.) 25
Cameco Corporation 25
De Beers Canada Exploration Inc. – Attawapiskat Kimberlites 25
Falconbridge Limited 26
Geodex Minerals Ltd. – Fletch–Matchinameigus Property 26
Golden Goose Resources Inc. – Magino Mine 27
Hedman Resources Limited – Horwood Township Property 27
Navigator Exploration Corp.–Canabrava Diamond Corporation – Kat Project 27
Patricia Mining Corp. – Island Gold Project 29
Pele Mountain Resources Inc. – Festival Property 31
River Gold Mines Ltd. – Magnacon Project 31
Spider Resources Inc., KWG Resources Inc. and Diagem International Resource Corp. – Wawa Project 31
Spider Resources Inc., KWG Resources Inc. and De Beers Canada Exploration Inc.
Spider #3 Joint Venture, James Bay Lowland 33
Strike Minerals Ltd. – Edwards Mine 33
Timginn Explorations Limited 33
VenCan Gold Corporation – Edwards Gold Property 33

RESIDENT GEOLOGIST PROGRAM STAFF AND ACTIVITIES....34
PROPERTY EXAMINATIONS....35
Shenango Alkalic Intrusion....35
Mineral Prospects and Occurrences in Denton Township....37
Gold Associated with Fractures and Shear Zones within the Eastern Part of the Carlton Lake Pluton....37
Gold Associated with Fractures and Shear Zones in Supracrustal Rocks near the Southern Contact of the Carlton Lake Pluton....38
Gold Associated with Syenitic, Quartz-Feldspar Porphyritic Intrusions....38
Gold Associated with Regional Deformation and/or Shear Zones....39
Base Metal Occurrences....39
The Naming of Mineral Occurrences and Prospects....40
Keno Property, Kenogaming Township....46
Access and Location....46
Geology....46
Southern Swayze Greenstone Belt....47
RECOMMENDATIONS FOR EXPLORATION....49
Gold in the Southern Swayze Greenstone Belt....49
Diamonds....49
OGS ACTIVITIES AND RESEARCH BY OTHERS....53
Operation Treasure Hunt....53
ACKNOWLEDGMENTS....53
REFERENCES....63

Tables

Table 1. Summary of claims recorded and assessment work credit in the Timmins District, 1995–2002. 10
Table 2. Mine production and reserves in the Timmins District....17
Table 3. Gold Production in the Timmins Regional Resident Geologist District to the end of 2002. 18
Table 4. Gold production from the Wawa area to the end of 2002....19
Table 5. Base metal production in the Timmins District to the end of 2002. 19
Table 6. Exploration Activity in the Timmins District in 2002. 22
Table 7. Exploration activity in the Wawa area in 2002....24
Table 8. Results released in 2002 for samples taken from the GQ Property, Band-Or Resources Ltd., Wawa....25
Table 9. Inferred resource calculations for Island Gold Project, Jacobson Township. 29
Table 10. Results of diamond analysis released for the Festival Property in 2002....30
Table 11. Results released in 2002 for bulk samples taken from the Wawa Project (Spider Resources Inc.). 32
Table 12. Diamond results for selected reconnaissance samples collected from the Wawa Project (Spider Resources Inc.) in 2002....32
Table 13. Summary of staff activities, Timmins Regional Resident Geologist Office, 2002. 35
Table 14. The mineral prospects and occurrences in Denton Township. 41
Table 15. Confirmed diamond and kimberlite occurrences in the Wawa area. 50
Table 16. Known diamond and kimberlite occurrences of the Timmins District....51
Table 17. Assessment files received for the Timmins District in 2002. 54
Table 18. Publications received by the Timmins Regional Resident Geologist's Office in 2002. 60

Figures

Figure 1. Timmins Regional Resident Geologist District. 2
Figure 2a. Timmins Regional Resident Geologist District (Northwest Part). 3
Figure 2b. Timmins Regional Resident Geologist District (Northeast Part). 4
Figure 2c. Timmins Regional Resident Geologist District (West-Central Part). 5
Figure 2d. Timmins Regional Resident Geologist District (East-Central Part) 6
Figure 2e. Timmins Regional Resident Geologist District (Southwest Part). 7
Figure 2f. Timmins Regional Resident Geologist District (Southeast Part). 8
Figure 2g. Timmins Regional Resident Geologist District (Wawa Area). 9
Figure 3. Timmins Regional Resident Geologist District (Timmins Area) 10
Figure 4. Stratigraphic cross-section of the ore zones of the Agrium Inc. Kapuskasing Phosphate Operations, Cargill Township 15
Figure 5. Schematic of the Montcalm nickel-copper deposit, Montcalm Township indicating the 3 separate ore bodies. 20
Figure 6. Shape, size, and grade of select Attawapiskat kimberlites. 26
Figure 7. Geological plan of Hedman Resources Limited – Horwood Township property 28
Figure 8. Diamond drill section 600N through the Hedman Resources Limited antigorite deposit, Horwood Township 29
Figure 9. Property outline and diamond drill hole location map in the vicinity of Gilles Lake, Tisdale Township by Timginn Explorations Limited. 34
Figure 10. Greyscale magnetic image of the Shenango alkalic intrusion with accompanying circular magnetic feature. 36
Figure 11. Railroad cut through the Shenango alkalic intrusion near Shiners Lake, Shenango Township 36
Figure 12. Location map of mineral occurrences in Denton Township. 40
Figure 13. Thinly interbedded fine-grained clastic and chemical metasediments from the Keno property, Kenogaming Township. 47
Figure 14. Geology of the southern Swayze greenstone belt in the vicinity of the Young Shannon and Jerome gold mines. 48
Figure 15. Outcrop of Timiskaming-like, heterolithic, clast-supported conglomerate. 48
Figure 16. Diamond occurrences in the Wawa area. 49
Figure 17. Diamond occurences and kimberlite in Lalibert, Leclaire, Menzies and Musquash townships. 50

TIMMINS REGIONAL RESIDENT GEOLOGIST DISTRICT—2002

B.T. Atkinson[1], G. Wm. Seim[2], A.C. Wilson[2], D.M. Draper[3], P. Hope[4] and A.M. Koroschetz[5]

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INTRODUCTION

Over the year, exploration activity declined as a result of lingering low gold and base metal prices. Toward year end as the price of gold climbed above the $325US level, previously dormant gold exploration projects were reactivated, resulting in an increase in exploration diamond drilling and re-opening of several underground gold projects. Claim staking declined significantly as indicated in Table 1; in part, this is attributed to the high level of claim staking in the preceding year, particularly for diamond exploration in the Wawa to Kapuskasing area and the James Bay Lowland.

Consolidation of operations and company mergers directly affected a number of operations is the district. In July, Placer Dome Inc. and Kinross Gold Corporation merged their respective Timmins operations under the Porcupine Joint Venture. As a result, gold ore from the Hoyle Pond operations is now trucked to the Dome Mine for milling.

A corporate merger between Newmont Mining Corporation and Franco Nevada Mining Corporation Limited resulted in Franco Nevada becoming a wholly owned branch of Newmont. The Newmont Timmins exploration office was closed at year end. Kinross Gold Corporation, Echo Bay Mines Ltd. and TVX Gold Inc. initiated merger plans to form a single company under the Kinross Gold Corporation nameplate. St. Andrew Goldfields Ltd. merged with United Tex-Sol Mines Inc. and Royal Victoria Minerals Ltd. These companies are now all part of St. Andrew Goldfields Ltd.

Several junior mining companies re-activated underground gold projects with the intent of bringing these to production. Falconbridge Limited advanced the Montcalm nickel-copper project in Montcalm Township to the feasibility stage.

De Beers Canada Exploration Inc. continued work on the prefeasibility of the Victor kimberlite project west of Attawapiskat following a summer cessation as a result of issues related to the Attawapiskat First Nation. This project was advanced to the full feasibility stage at year end. Construction of a 375 km hydroelectric power line from Moosonee to Attawapiskat was completed at a cost of $58 million. Excess power capacity of the line may be useful in future mining operations of the area.

The Discover Abitibi Initiative is a partnership between the Federal and Provincial governments, the municipalities of Timmins, Kirkland Lake and Black River–Matheson and the mining industries of these communities. Under the Discover Abitibi Initiative, airborne geophysical surveys covering 11 173 line kilometres were flown north of Timmins. That work was done in combination with Falconbridge Limited.

Exploration activities for the Sault Ste. Marie District are described in a separate chapter within this report.

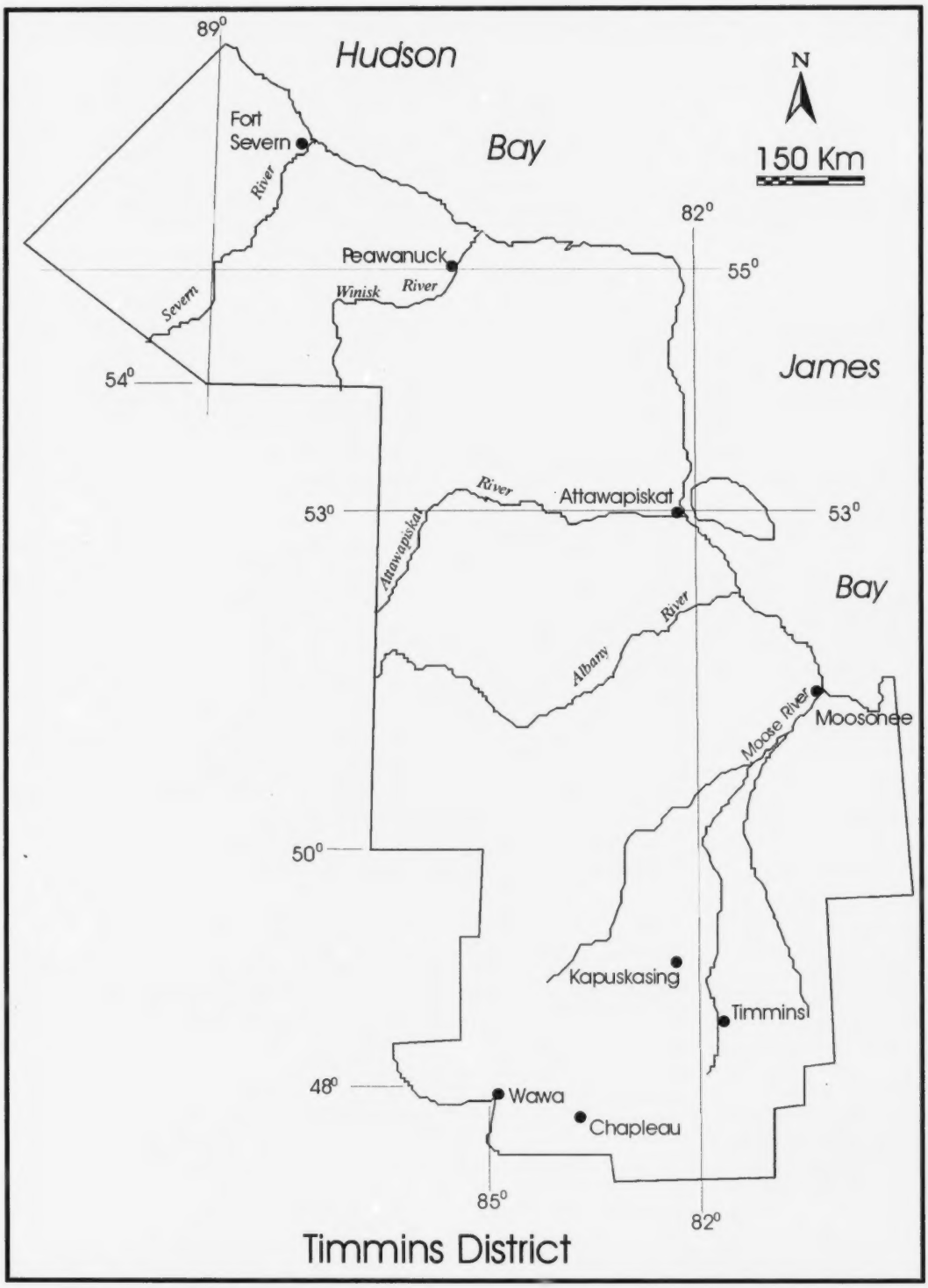


Figure 1. Timmins Regional Resident Geologist District.

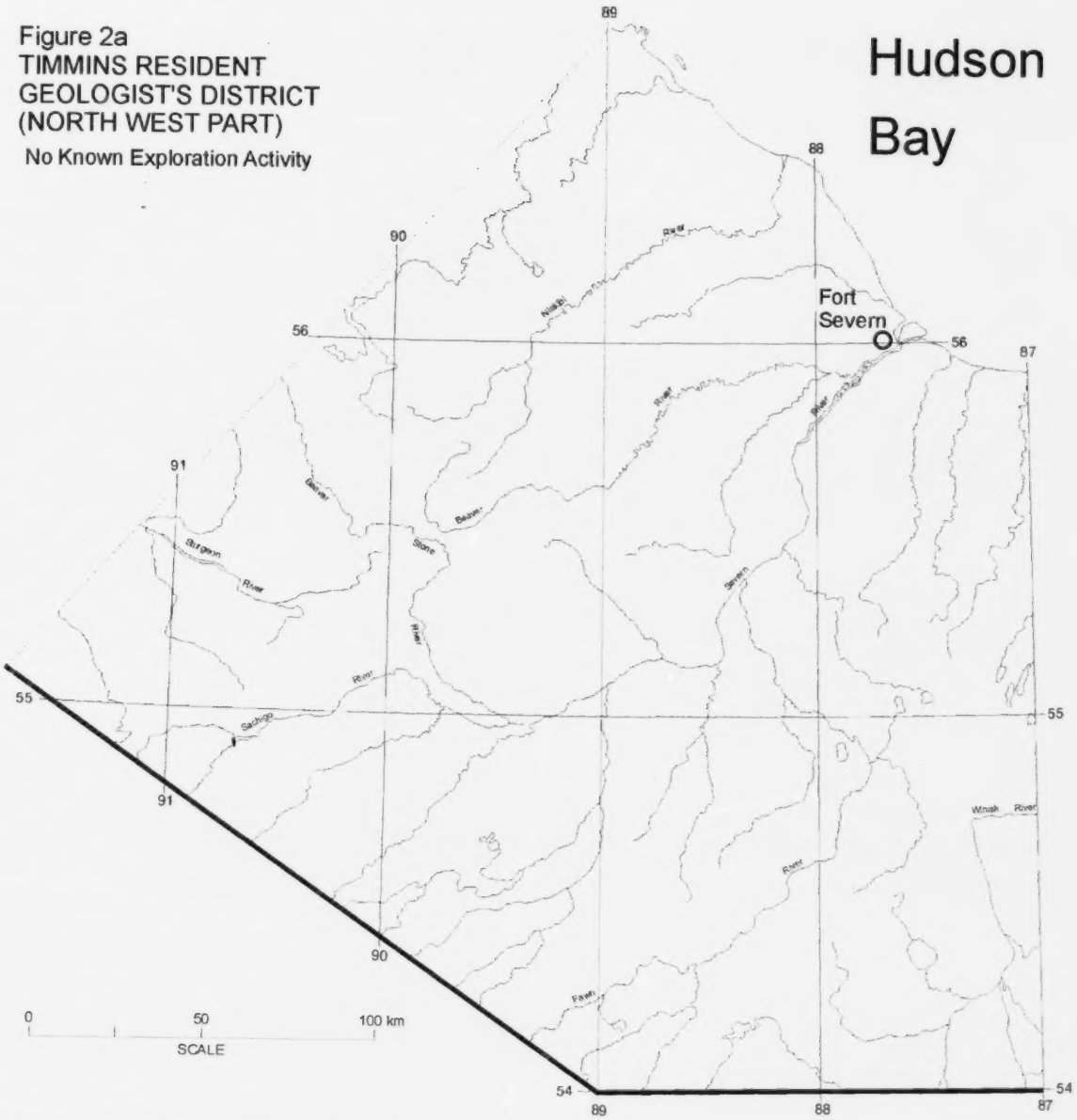


Figure 2a. Timmins Regional Resident Geologist District (Northwest Part).

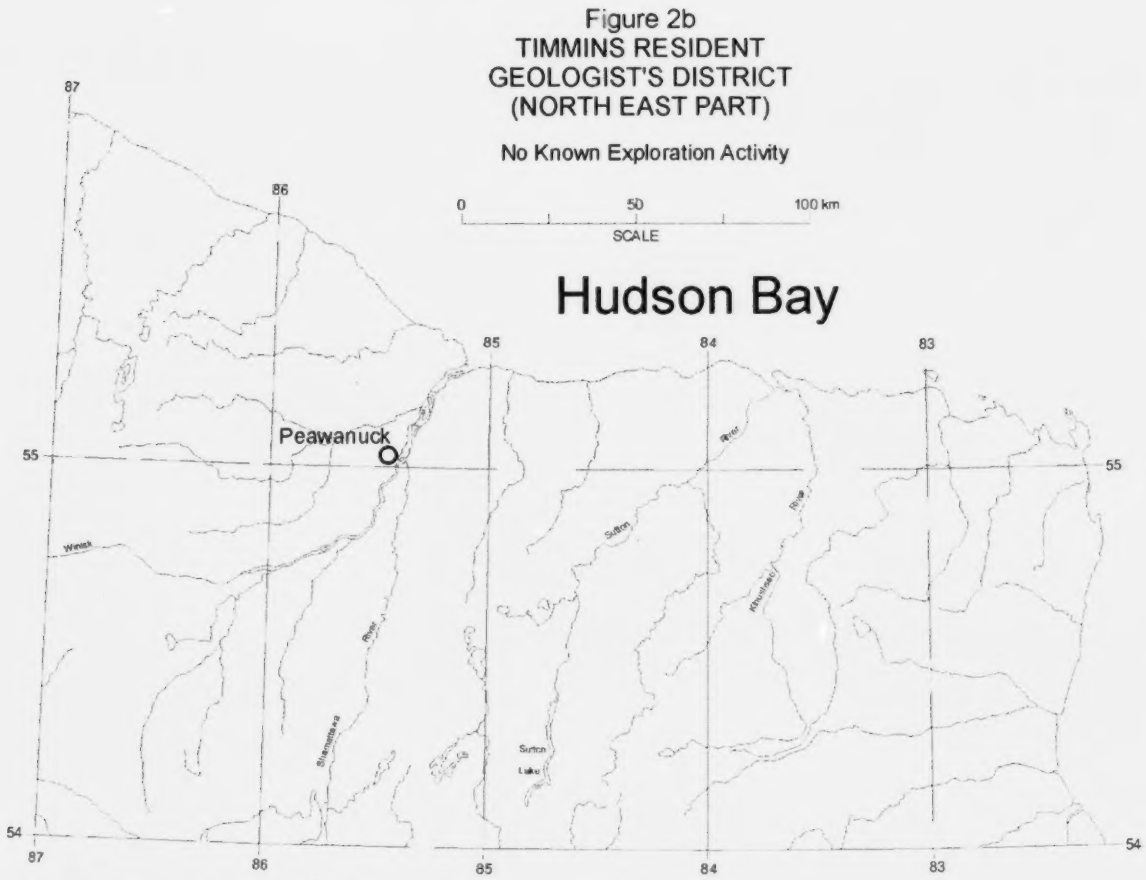


Figure 2b. Timmins Regional Resident Geologist District (Northeast Part).

Figure 2c TIMMINS RESIDENT GEOLOGIST'S DISTRICT (WEST CENTRAL PART)

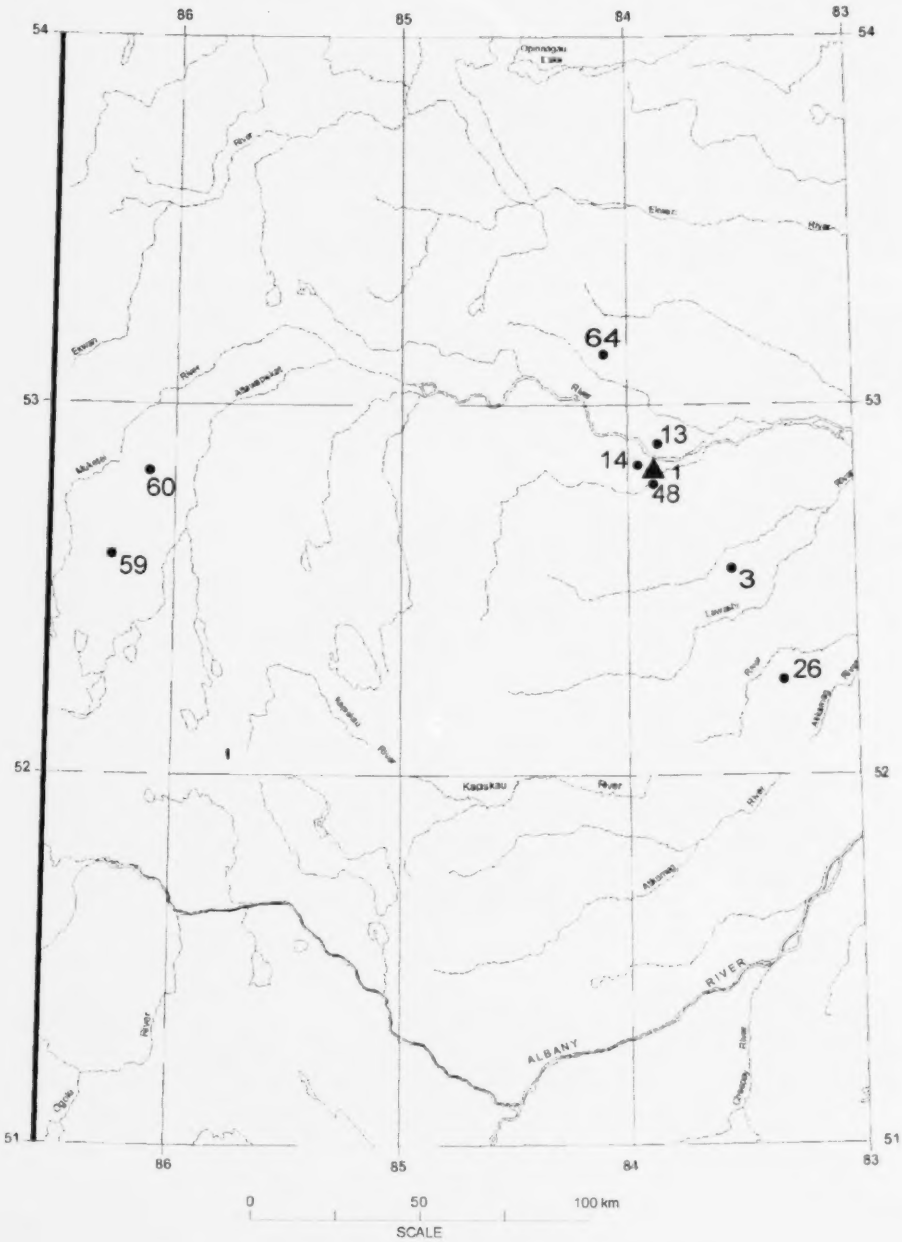


Figure 2c. Timmins Regional Resident Geologist District (West-Central Part). Exploration programs keyed to Table 6.

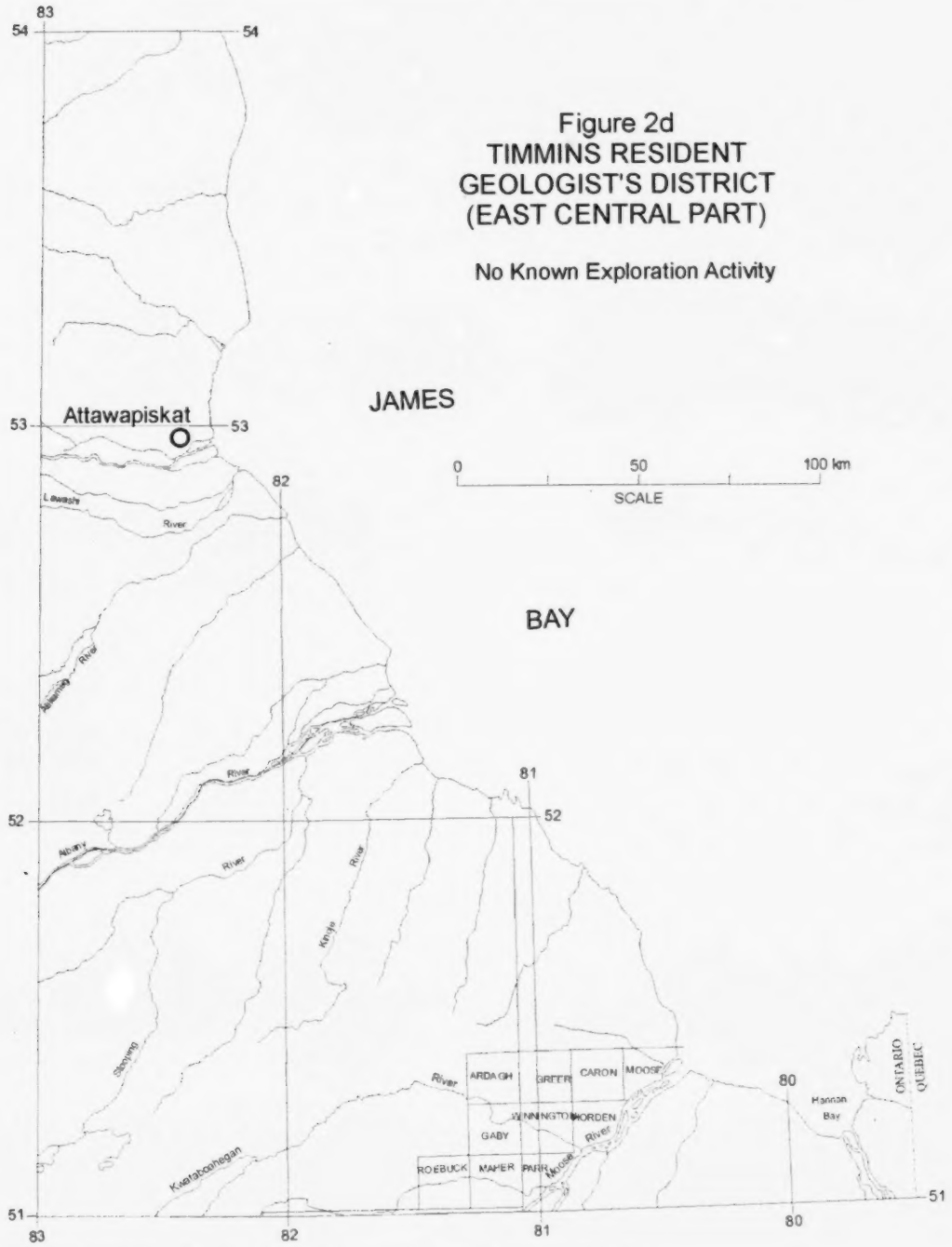


Figure 2d. Timmins Regional Resident Geologist District (East-Central Part).

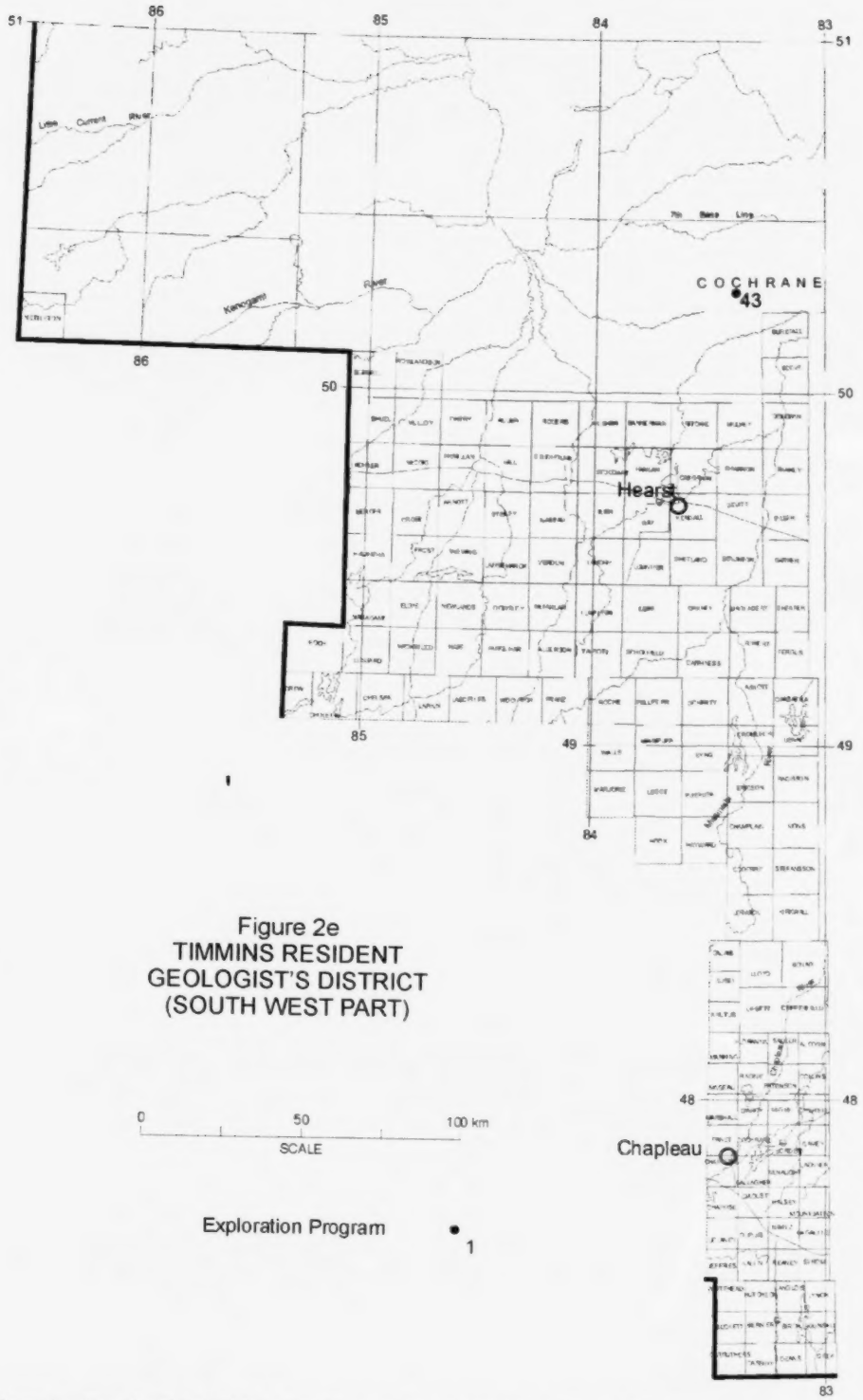


Figure 2e. Timmins Regional Resident Geologist District (Southwest Part). Exploration programs keyed to Table 6.

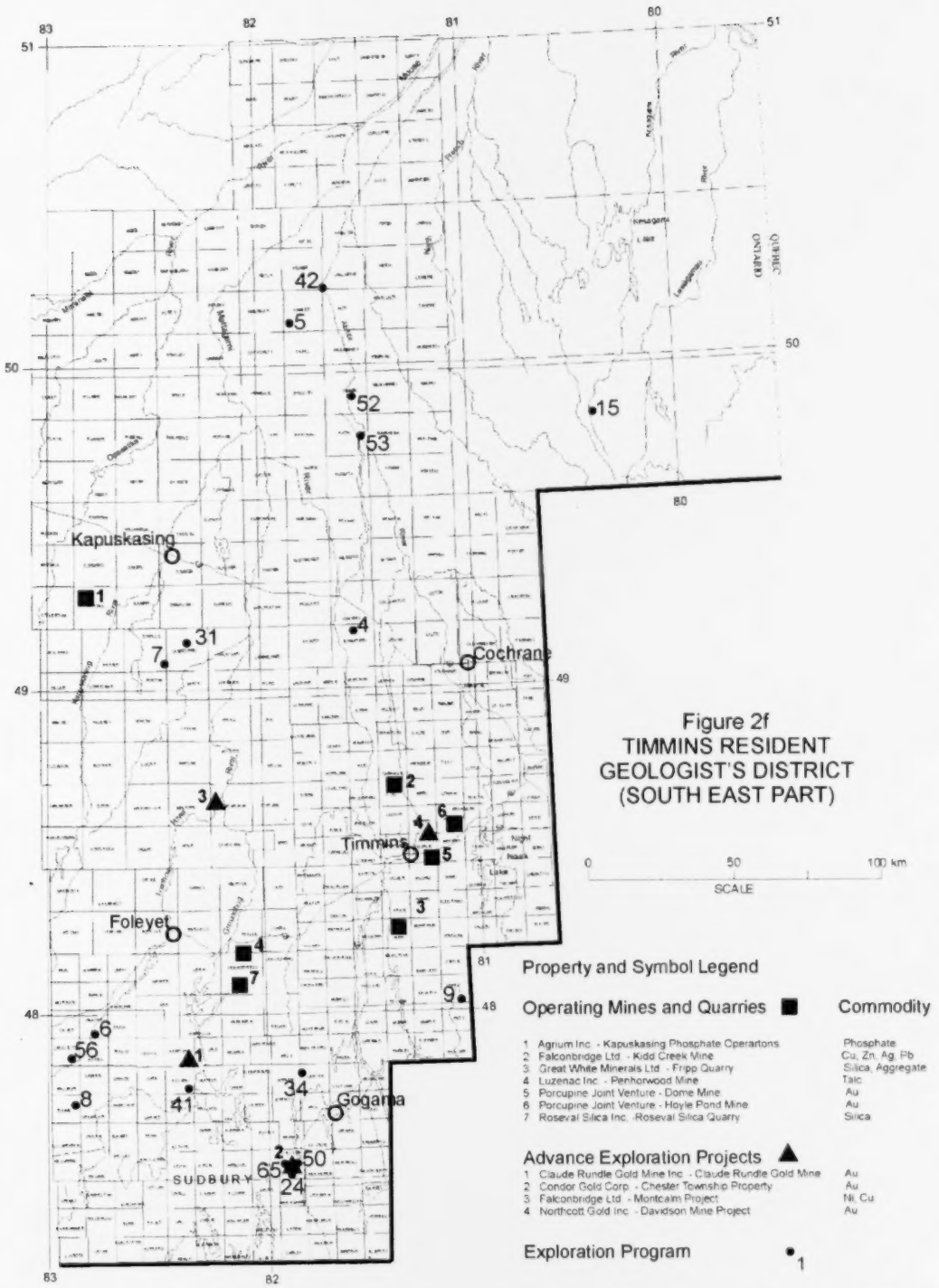

Kapuskasing
Cochrane
Timmins
Foleyet
Gogama
SUDBURY
ONTARIO
Figure 2f
TIMMINS RESIDENT
GEOLOGIST'S DISTRICT
(SOUTH EAST PART)
0
50
100 km
SCALE
Property and Symbol Legend
Operating Mines and Quarries
Commodity
1 Agrium Inc. - Kapuskasing Phosphate Operartons Phosphate
2 Falconbridge Ltd. - Kidd Creek Mine Cu, Zn, Ag, Pb
3 Great White Minerals Ltd. - Fripp Quarry Silica, Aggregate
4 Luzenac Inc. - Penhorwood Mine Talc
5 Porcupine Joint Venture - Dome Mine Au
6 Porcupine Joint Venture - Hoyle Pond Mine Au
7 Roseval Silica Inc. -Roseval Silica Quarry Silica
Advance Exploration Projects
1 Claude Rundle Gold Mine Inc. - Claude Rundle Gold Mine Au
2 Condor Gold Corp. - Chester Township Property Au
3 Falconbridge Ltd. - Montcalm Project Ni, Cu
4 Northcott Gold Inc. - Davidson Mine Project Au
Exploration Program

Figure 2f. Timmins Regional Resident Geologist District (Southeast Part). Exploration programs keyed to Table 6.

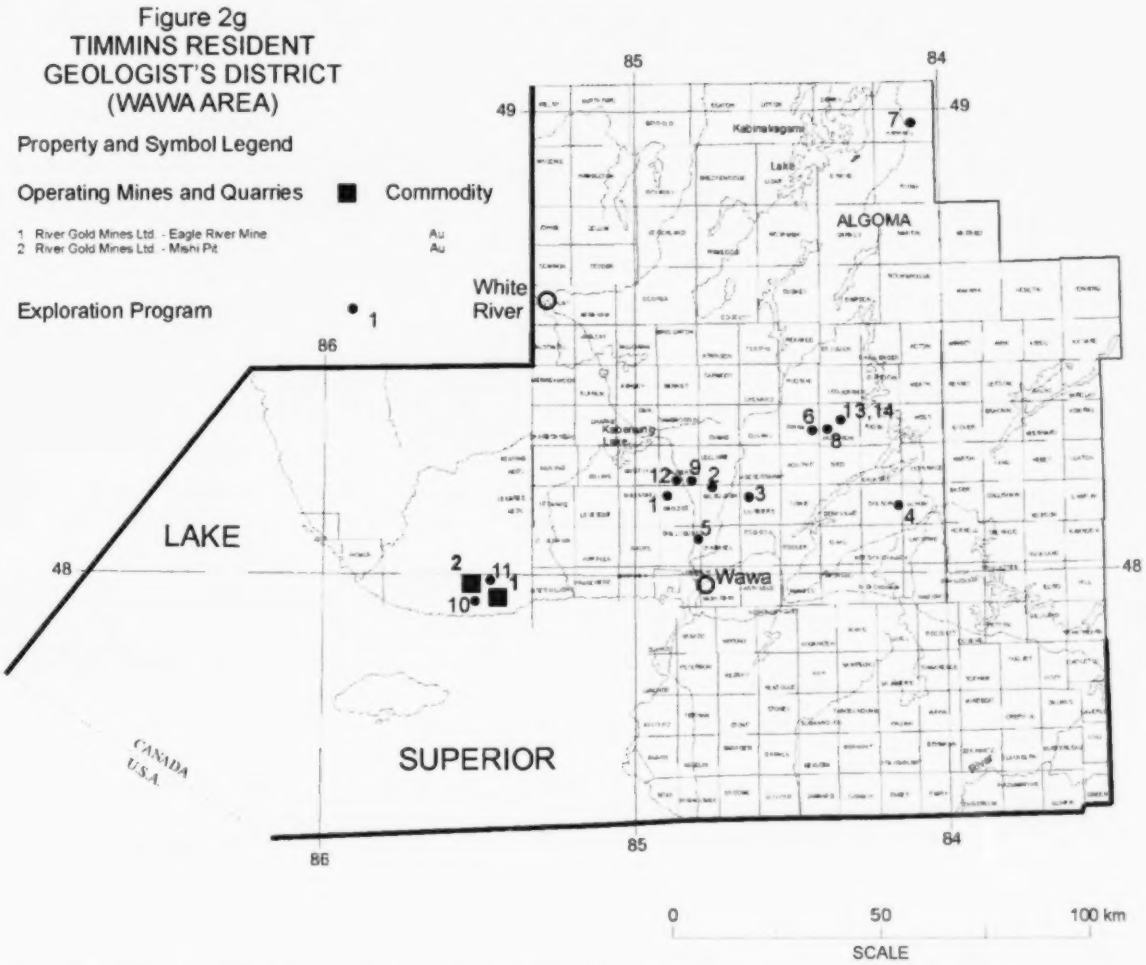


Figure 2g. Timmins Regional Resident Geologist District (Wawa Area). Exploration programs keyed to Table 7.

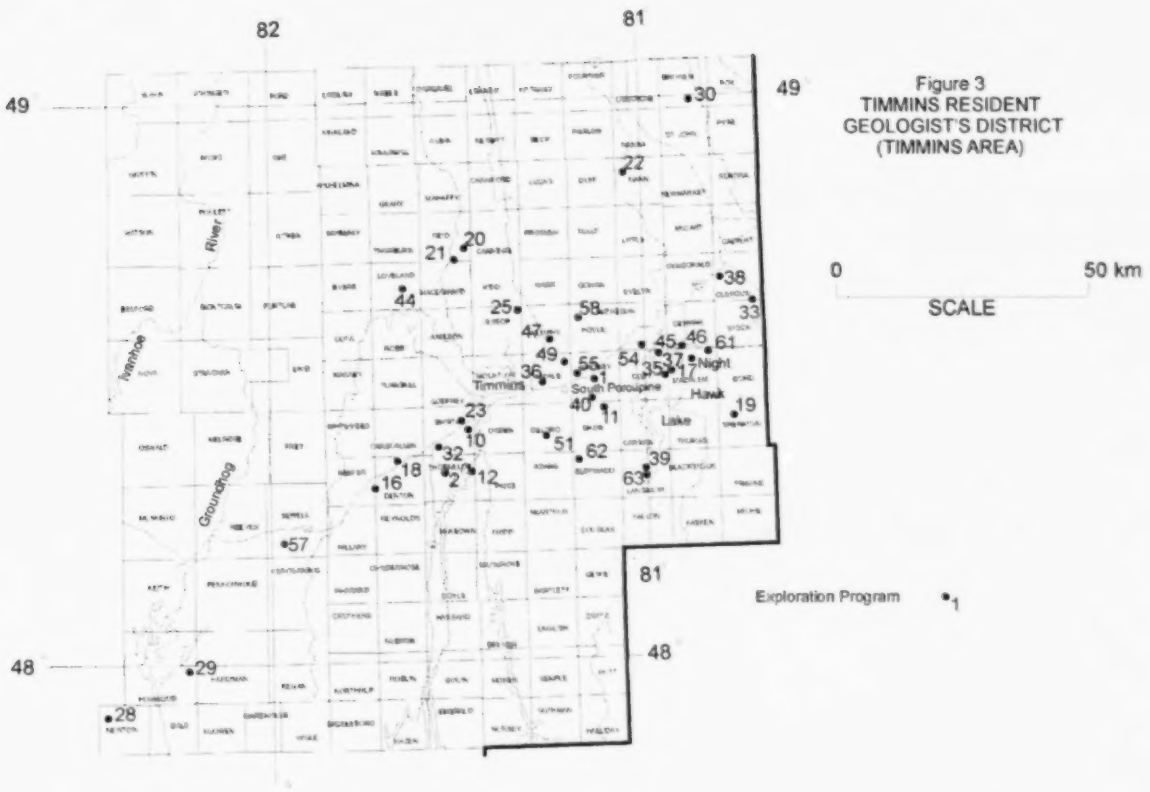


Figure 3. Timmins Regional Resident Geologist District (Timmins Area). Exploration programs keyed to Table 6.

Table 1. Summary of claims recorded and assessment work credit in the Timmins District, 1995–2002.

Year	Claim Units Recorded	Claim Units Cancelled	Claim Units Active	Diamond Drilling ($)	Physical Work ($)	Geotechnical Work* ($)	Total ($)
2002	11 423	14 705	39 964	N/A	N/A	N/A	5 419 054
2001	18 258	11 759	42 835	N/A	N/A	N/A	4 996 755
2000	11 035	15723	35 905	N/A	N/A	N/A	4 946 371
1999	12 312	16 557	42 270	N/A	N/A	N/A	10 665 577
1998	12 642	11 300	46 515	N/A	N/A	N/A	17 308 110
1997	10 771	16 908	45 173	N/A	N/A	N/A	10 707 864
1996	13 859	15 876	50 739	4 788 424	216 812	3 288 156	8 418 072
1995	14 376	7 769	60 705	2 003 632	202 191	2 742 497	5 052 359

** As of 1992, Geological and Geophysical Survey data are combined as Geotechnical Work*
N/A *Not available, figures no longer reported separately as of 1997.*

MINING ACTIVITY

Falconbridge Limited continued to mine copper, zinc and silver ore at the Kidd Creek Mine, which is currently the only operating base metal mine in the Timmins district.

Gold mining continued throughout the year at the Dome Mine and the Hoyle Pond Mine in Timmins and at the Eagle River Mine in Wawa. On July 1st, the Timmins operations of Placer Dome Inc. and Kinross Gold Corporation were merged as the Porcupine Joint Venture. Placer Dome holds 51% of the Porcupine Joint Venture and is the

operator, while Kinross holds the remaining 49% of the new company. As a result of the merger, gold ore from the Hoyle Pond Mine is now trucked to the Dome Mine for milling. The Bell Creek mill, where Hoyle Pond ore had been milled previously, was placed on a care and maintenance status. Exploration efforts of the 2 companies were also combined and this amounted to a $5 million diamond drilling program on a number of properties throughout the Timmins area. Diamond drilling continued to delineate near surface gold mineralization at the Pamour Mine in an attempt to return that property to production as an open pit operation. At the McIntyre Mine, a barge-mounted diamond drill on Pearl Lake targeted gold mineralization in the Pearl Lake porphyry.

Several underground gold projects were reactivated. At the Davidson Tisdale Mine in Tisdale Township, underground workings were re-opened for renewed exploration work by Northcott Gold Corporation.

Northville Gold Corporation re-opened a ramp and de-watered underground mine workings at the Young Shannon Mine in Chester Township.

River Gold Mines Inc. completed shaft deepening and ramp access at the Eagle River Mine near Wawa. Ore reserves were increased by 35% and the Mishi Mine at Mishibishu Lake commenced production as an open pit gold mine.

Historical gold production for Timmins and Wawa is presented in Tables 2 and 3; historical base metal production for Timmins is presented in Table 4. Current mine production from Timmins is tabulated in Table 5.

The locations of the producing mines are indicated on Figures 2f and 2g. Exploration activities throughout the District are keyed to Figures 2c, 2e, 2f, 2g and 3.

Base Metal Mining

FALCONBRIDGE LIMITED – KIDD CREEK MINE

Falconbridge Limited – Timmins operations include the Kidd Creek base metal mine and the Kidd Metallurgical Site. Combined, these operations are the largest employer in Timmins. New developments at the Kidd Creek Mine include the deep development project currently in progress to access copper and zinc ore beneath the 6800 foot level. Stage one of the $640 million project is underway. This part of the project has an estimated cost of $550 million of which, $106 million was spent in the current year. Phase two is planned to extend the workings from the 8800 foot level to the 10 200 foot level. Internal shaft sinking and ramping is in progress and is presently below the 7700 foot level. The internal shaft has a planned depth of 1870 m below the 6200 foot level. At year end, 580 m of shaft development had been completed. The ramp was down to the 7700 foot level of a planned bottom at the 8800 foot level.

Production amounted to 2 229 830 tonnes of ore grading 2.18% copper, 5.87% zinc and 78 g/t silver. The daily milling rate was 6400 tonnes.

Ore reserves at year end are

Category	Tonnes	Copper (%)	Zinc (%)	Silver (g/t)
Proven	13 409 000	2.01	5.77	76
Probable	10 285 000	2.25	6.98	54
Total	23 694 000	2.11	6.30	66

The principle mining method was blast hole mining and minimal block caving. Mining was active on 32 levels with 52 active headings for both production and development. Underground operations included 6389 m of drifting and 3043 m of raising.

Mine site exploration included 7 diamond drill holes with a combined length of 5033 m.

The Kidd Creek Mine employs 515 people and an additional 300 contractors are working on site on the deep development project being completed by Cementation Skanska. The Kidd metallurgical operations employ an additional 800 people. D. Gignac is the General Manager of the Mining Division, C. Ferron is the General Manager of the Metallurgical Division and D. Duff is the Chief Geologist (D. Duff, Falconbridge Limited, written communication, 2003).

Gold Mining

PORCUPINE JOINT VENTURE KINROSS GOLD CORPORATION – HOYLE POND MINE

Production from the Hoyle Pond Mine was 157 287 ounces of gold from 454 000 tonnes of ore milled. The ore grade was 11.96 grams per tonne and the mill achieved a recovery rate of 90.1%. The daily milling rate was 1244 tonnes.

Ore reserves at the end of 2001 were

	Tonnes	**Grade Gold** (g/t)	**Ounces**
Proven:	366 740	13.31	156 964
Probable:	553 798	14.04	249 948
Total	920 538	13.75	406 912

Underground development included 10 005 m of drifting and 1445 m of raising. Mining was active on 40 headings. Diamond drilling amounted to 25 994 m for ore definition and 35 339 m of exploration drilling.

Regional exploration by Kinross Gold Corporation was carried out on several former Royal Oak Mines Limited properties that Kinross acquired in 1999. Exploration diamond drilling amounted to 73 150 m. Diamond drilling was completed on the McIntyre Central Porphyry Zone (Pearl Lake porphyry), the Coniaurum mine area and north of the Pamour Mine. Total surface drilling was 7753 m. During the year, Kinross Gold Corporation acquired all the mine and exploration assets of Pentland Firth Ventures Ltd. (A. Still, Kinross Gold Corporation, written communication, 2002).

The Hoyle Pond Mine operations were combined with the Dome Mine as of July 1st. Gold ore was milled at the Bell Creek mill until that date, after which it was trucked to the Dome mill for processing.

The combined Porcupine Joint Venture operations employ 700 people, 231 of those work at the Hoyle Pond Mine.

G. Halverson is the Mine Manager and A. Still is the Chief Geologist.

PORCUPINE JOINT VENTURE PLACER DOME (CLA) LIMITED – DOME MINE

At the Dome Mine, in Tisdale Township, gold production amounted to 280 206 ounces gold from 3 621 923 tons milled. The ore grade was 0.070 ounce per ton gold and the milling rate was 10 940 tons per day. The mill recovery rate was 92.0%.

Ore reserves at the end of the year 2001 were

	Tons	**Grade** (ounce per ton)
Proven	12 323 000	0.031
Probable	15 892 000	0.059
Total	28 215 000	0.047

Mining operations included open pit truck and shovel operations, and underground long hole stoping and cut and fill methods. Underground development totalled 6488 feet of drifting and 1076 feet of raising while underground diamond drilling included 30 516 feet of ore definition and 31 099 feet of exploration drilling.

Of the 700 employees of the Porcupine Joint Venture, 469 work at the Dome Mine. The Dome Mine employs 469 people in the mining and milling operations.

RIVER GOLD MINES LTD. – EAGLE RIVER MINE

The Eagle River Mine is located on the north shore of Lake Superior, approximately 50 km west of the town of Wawa, in the Mishibishu Lake greenstone belt. Access to the mine and mill facilities is via a 70 km long gravel road leading south from the Trans-Canada Highway. The River Gold mill is located 17 km north of the Eagle River Mine.

Gold production for the year amounted to 281 600 tonnes at a grade of 8.17 g/t Au for a total of 73 938 ounces of gold. Cumulative production since 1995 is 1 527 282 tonnes at a grade of 9.09 g/t Au for a life of mine production of 446 421 ounces of gold. During the year, ore reserves were increased by 35%.

Surface diamond drilling amounted to 42 000 m and resulted in the discovery of gold in iron formation 600 m west of the mine workings. Drilling to the west of the main mineralized zone intersected widespread quartz veins, the best of which averaged 8.12 g/t Au over a true width of 1.8 m. Gold mineralization also occurs associated with a pyrite-pyrrhotite sulphide zone hosted by the iron formation. This zone is located north of the No. 8 Zone structure. Recent diamond drilling intersected the same structure at a depth of 165 m, and returned an assay of 5.46 g/t Au over 2.4 m (River Gold Mines Ltd., press release, November 26, 2002).

Underground diamond drilling for ore definition and exploration amounted to 40 000 m. This resulted in the discovery of a new gold mineralization in the No Name Lake Zone located 320 m south of the main ore zone.

The 505 m shaft was completed in January and was operational by mid-May. In conjunction with the shaft sinking, the company extended the ramp to the 460 m level to provide advance development of the high-grade No. 6 Zone. Besides cutting production costs, the shaft has enabled the establishment of exploration drifts, which have been used to drill-test several zones that remain open at depth. The highlight of the drilling was the identification of strong mineralization between depths of 600 and 700 m on the No. 6 Zone. Significant assays in this zone include 77.71 g/t Au over 3 m of core (2 m true width). The company has also received encouraging results from the No. 8 Zone, No. 2 Zone. All zones have returned strong gold values (River Gold Mines Ltd., press releases, October 18 and November 26, 2002).

Mining operations at Eagle River utilize trackless equipment and shrinkage and long hole stoping methods are employed. The Eagle River Mine employs 140 people.

RIVER GOLD MINES LTD. – MISHI PIT

Open pit mining at the Mishi property began in mid-year. The pit is located 2 km west of the River Gold mill. By year end, 18 400 tonnes of ore had been processed, yielding 2570 ounces at a recovered grade of 4.3 g/t Au. An additional 28 000 tonnes of ore grading 3.82 g/t Au were stockpiled.

The Mishi deposit was discovered in the mid-1980s by MacMillan Gold Corporation and Granges Exploration Ltd, and acquired by River Gold in 1998. In 2001, River Gold reported that the open-pittable, probable mineral reserve was 104 000 tonnes grading 3.75 g/t Au. Beneath the projected open pit, the same zone hosts indicated resources of 298 000 tonnes grading 4.9 g/t Au. An additional inferred resource, in 4 separate zones, total 859 000 tonnes at a grade of 5.1 g/t Au (River Gold Mines Ltd., 2001 Annual Report).

Gold mineralization is hosted by strongly sheared mafic metavolcanic rocks, quartz-eye bearing rocks of undetermined origin and clastic metasedimentary rocks. The metavolcanic rocks consist of massive, medium- to coarse-grained, amphibole- and plagioclase-bearing flows and sills that are variably sheared to chlorite-calcite schists. The metasedimentary rocks are polymictic conglomerates and wackes, that have been sheared and altered to calcite + sericite + iron carbonate schist.

As a result of low gold prices throughout the year, production was halted at the Edwards Mine and that operation was sold. Production from the remaining stockpile of 8800 tonnes amounted to 2027 ounces of gold for an average grade of 7.5 g/t Au. Cumulative production from the Edwards Mine from 1997 to 2002 is 140 258 ounces of gold from 389 309 tonnes of ore grading of 11.2 g/t (G. Mannard, River Gold Mines Ltd., written communication, 2003).

Industrial Mineral Production

AGRIUM INC. – KAPUSKASING PHOSPHATE OPERATIONS

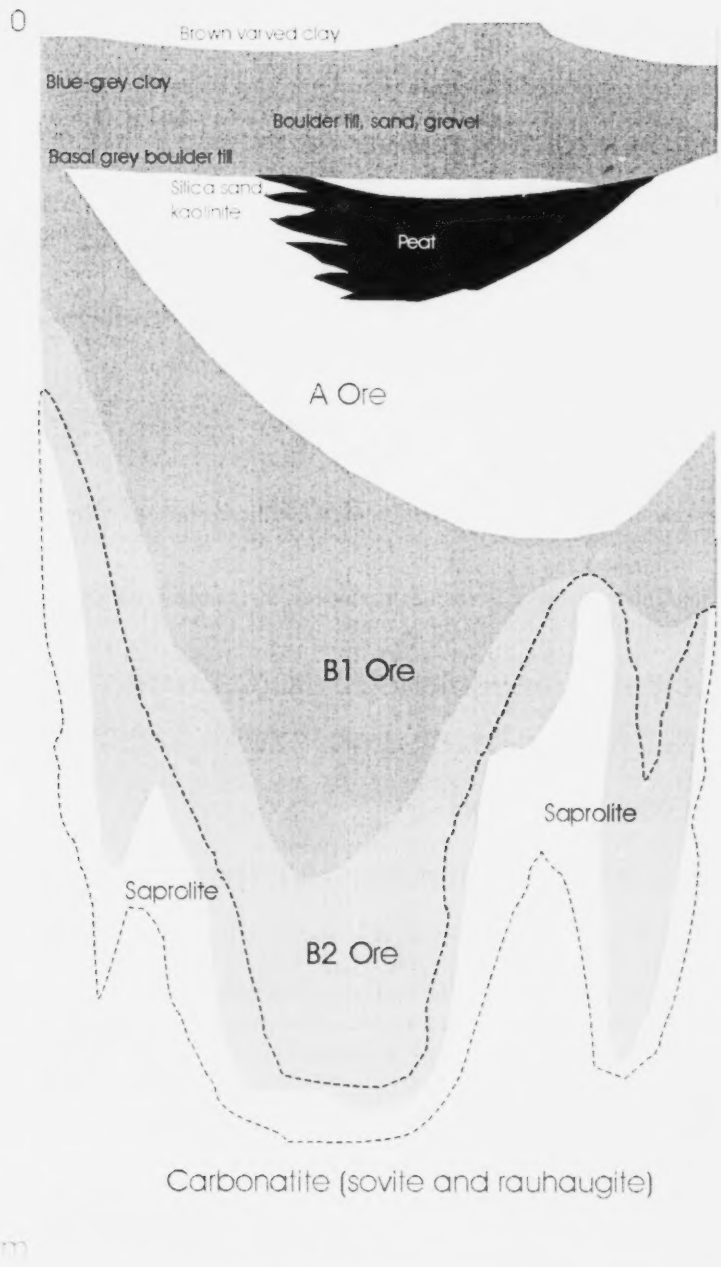
Agrium Inc.'s Kapuskasing Phosphate Operations, located 40 km southwest of Kapuskasing, operated throughout the year. Apatite sand is mined as a residual deposit of weathered carbonatite from the Cargill Township carbonatite complex and concentrated on site in a high capacity mill. The concentrate is loaded into rail cars and shipped to Agrium's Redwater, Alberta fertilizer plant for processing into fertilizer. Details of the deposit geology and geochemistry are presented in Sage (1988) and Pressacco (2001). A schematic cross-section of the phosphate mineralization is presented in Figure 4.

Phosphate production amounted to 1 003 000 tonnes from 1 775 000 tonnes milled at a grade of 32.2% P_2O_5. The mill operated at a daily rate of 4865 tonnes with a recovery of 64% P_2O_5. Proven and probable ore reserves are 16 million tonnes with a grade of 27.5% P_2O_5.

Surface drilling included 18 750 m for ore definition and 3410 m of exploration drilling. Exploration emphasis was on the B Zone. The Lost River diversion was completed to provide access to additional ore and the plant sedimentation pond was expanded during the year. A new floculant settling basin was constructed.

Agrium Inc. Kapuskasing Phosphate Operations has a workforce of 106 people, including 40 people employed in the mining operations and 66 workers in the mill. A. Watson is the Mine Manager and R. Pressacco is the Mine Geologist (B. Balaski, Agrium Inc., written communication, 2002).

Figure 4. Stratigraphic cross-section of the ore zones of the Agrium Inc. Kapuskasing Phosphate Operations, Cargill Township (*modified from* Pressacco 2001).



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GREAT WHITE MINERALS LTD. – FRIPP SILICA QUARRY

Great White Minerals Ltd. produced silica from the Fripp Township quarry throughout the year.

LUZENAC INC. – PENHORWOOD MINE

The Penhorwood Mine operates at a rate of 600 tons per day with ore being broken, crushed and stockpiled on a seasonal basis by a mining contractor. The on-site mill processes the talc ore and produces a float concentrate that is shipped to the upgrading and microgrinding facilities in Timmins.

Production for 2002 amounted to 191 122 tonnes grading 48.6% talc. Tonnes milled amounted to 56 576 tonnes. The daily milling rate was 602 tonnes and the mill recovery was 61% talc.

Reserves at the mine to the end of 2002 were
Proven: 7 750 000 tonnes @ 48.6% talc.
Probable: 1 320 000 tonnes @ 48.6% talc

During the year, the Penhorwood Mine obtained ISO 14000 certification. Flotation cells in the mill circuits were upgraded.

The Penhorwood Mine employs a work force of 21 people and the Timmins milling operations employ 39 people. K. Tyler is the Mine Manager.

ROSEVAL SILICA INC. – PENHORWOOD SILICA QUARRY

Roseval Silica Inc. operated the Roseval silica quarry on an intermittent basis throughout the year.

ADVANCED EXPLORATION

De Beers Canada Exploration Inc. – Victor Diamond Project

De Beers Canada Exploration Inc. continued to evaluate the Victor Diamond Project, located 90 km west of Attawapiskat in the James Bay Lowland. In the preceeding years, De Beers had extracted a 10 000 tonne bulk sample of kimberlite for diamond evaluation. In 2001, a desktop engineering study of the project was completed. The results of that work were inconclusive, thus, additional site investigations were undertaken in the winter of 2002 as a detailed pre-feasibility engineering study. Environmental baseline studies and environmental monitoring programs were completed as part of the evaluation of the project in conjuction with consultation sessions held with Attawapiskat First Nation.

In the vicinity of the Victor kimberlite pipe, airborne magnetic and electromagnetic surveys flown over the area in 2001 were followed up in 2002 with drill testing of subtle geophysical anomalies to detect undiscovered kimberlite. A total of 21 holes were drilled, of which, 8 were part of the Victor pre-feasibility engieering study to evaluate overburden stratigraphy and bedrock characteristics for mine planning. No kimberlite was encountered in any of the drill holes.

Table 2. Mine production and reserves in the Timmins District.

Mine	Production in 2001		Production in 2002		Reserves at end of 2002	
	Tonnage @ Grade	Total Commodity	Tonnage @ Grade	Total Commodity	Tonnage	Grade
Agrium Inc., Kapuskasing Phosphate Operations	1,384,000 tonnes @ 33.0% P_2O_5	780,000 tonnes P_2O_5	1 775 000 tonnes @ 32.2% P_2O_5	1 003 000 tonnes P_2O_5	16 000 000 tonnes	27.5% P_2O_5
Falconbridge Limited, Kidd Creek Mine	1 977 222 tonnes @ 2.38% Cu, 5.40% Zn, 61 g/t Ag	105 312 tonnes Zn 47 058 tonnes Cu 3 824 755 oz Ag	2 229 000 tonnes @: 2.12% Cu, 5.87% Zn, 78 g/t Ag		23 694 000 tonnes** incl: proven 13 409 000 t probable 10 285 000 t	2.11% Cu, 6.30% Zn, 66 g/t Ag
Luzenac Incorporated, Penhorwood Mine	317 265 tonnes @ 48% talc	83 758 tonnes talc	191 122 tonnes @ 48.6% talc	56 576 tonnes talc	7 750 000 tonnes proven 1 320 000 tonnes probable	48.6% talc
Porcupine Joint Venture, Hoyle Pond Mine	443 892 tonnes @ 12.40 g/t	156 261 oz Au	454 000 tonnes @ 11.96 g/t Au	157 287 oz Au	N/A	N/A
Porcupine Joint Venture Placer Dome (CLA) Limited, Dome Mine	4 543 601 tons @ 0.075 opt Au	302 795 oz Au	3 621 923 tons @ 0.070 opt Au	280 206 oz Au	N/A	N/A
River Gold Mines Ltd., Eagle River Mine	246 000 tonnes @ 8.6 g/t Au	68 300 oz Au	281 000 tonnes @ 8.17g/t	73 938 oz Au	N/A	N/A
River Gold Mines Ltd., Edwards Mine	76 000 tonnes @ 8.8 g/t Au	22 000 oz Au	8800 tonnes @ 7.5g/t	2027 oz Au	N/A	N/A
River Gold Mines Ltd., Mishi Mine			18 000 tonnes @ 4.3 g/t	2570 oz Au	N/A	N/A

Notes:

Abbreviations: N/A – Data not available; g/t – grams per tonne; opt – ounces per ton.

** Proven and probable reserves*

*** Total of proven, probable and possible reserves.*

Table 3. Gold Production in the Timmins Regional Resident Geologist District to the end of 2002.

Mine Name	Township	In Production	Tons Milled	Oz. Au	Grade[1]
Ankerite/March	Deloro	1926-1935	317 769	61 039	0.19
Aquarius	Macklem	1984, 88-89	139 634	27 117	0.19
Aunor Pamour (#3)	Deloro	1940-84	8 482 174	2 502 214	0.30
Banner	Whitney	1927-28,-33,-35	315	670	0.13
Bell Creek	Hoyle	1987-91, 92-94	576 017	112 739	0.196
Bonetal	Whitney	1941-51	352 254	51 510	0.15
Bonwhit	Whitney	1951-54	200 555	67 940	0.34
Broulan Porcupine	Whitney	1939-53	1 146 059	240 660	0.21
Broulan Reef Mine	Whitney	1915-65	2 144 507	498 932	0.23
Buffalo Ankerite	Deloro	1926-53, 78	4 993 929	957 292	0.19
Cincinnati	Deloro	1914, 22-24	3 200	736	0.23
Concordia	Deloro	1935	230	16	0.07
Coniarum/Carium	Tisdale	1913-18, 28-61	4 464 006	1 109 574	0.25
Crown	Tisdale	1913-21	226 180	138 330	0.61
Davidson–Tisdale	Tisdale	1918-20, 88	53 221	2 438	0.26
Delnite (open pit)	Deloro	1937-64	3 847 364	920 404	0.20
		1987-88	56 067	3 602	0.77
DeSantis	Ogden	1933, 39-42, 61-64	196 928	35 842	0.18
Detour Lake	Sunday Lake	1983-99	16 005 557	1 781 858	0.111
Dome	Tisdale	1910	88 019 903	14 817 801	0.168
Faymar	Deloro	1940-42	119 181	21 851	0.180
Fuller (Vedron)	Tisdale	1940-44	44 028	6 566	0.15
Gillies Lake	Tisdale	1921-31, 35-37	54 502	15 278	0.28
Goldhawk (open pit)	Cody	1947	636	53	0.08
		1980	40 000	3 967	0.10
Halcrow–Swayze	Halcrow	1935	211	40	0.19
Hallnor (Pamour #2)	Whitney	1938-68, 81	4 226 419	1 690 560	0.40
Hollinger–Schumacher	Tisdale	1915-1918	112 124	27 182	0.24
Hollinger	Tisdale	1910-68	65 778 234	19 327 691	0.29
Pamour Timmins Property		1976-88	2 615 866	182 058	0.07
Hoyle – Falconbridge	Whitney	1941-44, 46-49	725 494	71 843	0.10
Hoyle Pond	Hoyle	1985-	4 546 354	1 753 222	0.385
Hugh–Pam	Whitney	1926, 48-65	636 751	119 604	0.19
Jerome	Osway	1941-43, 56	335 060	56 893	0.17
Joburke	Keith	1973-75, 79-81	440 117	43 571	0.10
Kingbridge/Gomak	Chester	1935-36	1 387	98	0.07
Marlhill	Hoyle	1989-91	156 800	30 924	0.199
McIntyre Pamour Schumacher	Tisdale	1912-88	37 634 691	10 751 941	0.29
(ERG Tailings recovery)		1988-89	2 549 189	18 260	
McLaren	Deloro	1933-37	876	201	0.23
Moneta	Tisdale	1938-43	314 829	149 250	0.47
Naybob (Kenilworth)	Ogden	1932-64	304 100	50 731	0.17
Nighthawk	Macklem	1995-99	1 479 607	175 803	0.12
Owl Creek	Hoyle	1981-89	1 984 400	236 880	0.12
Pamour #1 (Incl. pits 3, 4 & 7) Hoyle	Whitney	1936-99	45 795 863	4 078 525	0.09
Pamour (other sources)	Whitney	1936-99	7 416 634	676 645	0.091
Paymaster	Deloro	1915-19, 22-66	5 607 402	1 192 206	0.21
Porcupine Lake (Hunter)	Whitney	1937- 40,- 44	10 821	1 369	0.13
Porcupine Peninsular	Cody	1924-27,-40,-47	99 688	27 354	0.27
Preston	Tisdale	1938-68	6 284 405	1 539 355	0.24
Preston NY	Tisdale	1933	2 800	153	0.05
Preston/Porcupine Pet	Deloro	1914-15	NA	314	
Preston/Porphyry Hill	Deloro	1913-15	46	312	6.78
St. Andrew Goldfields – Stock	Stock	1989-94, 2000	815 429	129 856	0.16
Tionaga/Smith Thorne	Horwood	1938-39	6 653	2 299	0.35
Tisdale Ankerite	Tisdale	1952	14 655	2 236	0.15
Tommy Burns/ Arcadia	Shaw	1917	21	14	0.28
Vipond	Tisdale	1911-41	1 565 218	414 367	0.26
[1]*Grade: ounce gold per ton*	**Total** [2]		**322 946 360**	**66 130 186**	**0.205**

[2]*figures corrected from previous year*

Table 4. Gold production from the Wawa area to the end of 2002.

Mine Name	Township	In Production	Tons Milled	Oz. Au	Grade (ounce/ton or gram/tonne)
Alden–Goudreau	Cowie	1937, 40, 43, 45	13 479	3220	0.276
Centennial	Naveau	1939-40	8612	610	14.1
Cline	Jacobson	1938-40, 47-48	331 842	63 328	5.2
Darwin/Grace	McMurray	1902-03, 07-08, 10, 23, 25, 30, 35, 37, 40, 43-44	45 528	15 191	3.0
Deep Lake	McMurray	1936-38, 43	2790	1633	1.7
Eagle River	Point Isacor	1995-	1 527 282	446 421	9.09 g/t
Edwards	Jacobson	1938 1997-2002	1537 389 309	485 140 258	3.2 11.2g/t
Holdsworth Prospect	Corbiere	1933	60	10	6
Kremzar	Finan	1988-90	392 858	37 678	4.5g/t
Magino/Algoma Summit	Finan	1930-40, 88-92	768 679 +	113 228	4.5 g/t
Magnacon	Mishibishu Lake	1989-90	165 000	15 356	10.7
Minto (includes Jubilee and Cooper)	McMurray	1929-42	184 600	37 678	4.9
Mishi	Mishibishu Lake	2002	18 000	2570	4.3g/t
Murphy/Algold/Amherst	Abotossaway	1926-32, 36-38, 40	23 211	2450	9.5
Norwalk/Manxman	Naveau	1904, 10	820	60	13
Parkhill	McMurray	1902, 29, 30-38, 40-44	125 778	54 301	2.3
Ranson	Rabazo	1939	774	156	4..96
Renabie	Leeson	1947-70, 1981-91	5 583 895	1 100 000	0.2
Smith/Van Sickle	McMurray	1935-36	9228	536	17.2
Stanley	McMurray	1936	1963	84	23.3
Surluga	McMurray	1968-69, 88-89	87 460	8898	0.10
Total			**9 682 705**	**2 044 151**	**0.211**

Table 5. Base metal production in the Timmins District to the end of 2002.

Mine Name	Township	In Production	Ore Milled	Grades
Alexo	Dundonald	1912-19 1943-44	51 857 tons 4923 tons	4.5% Ni, 0.55% Cu
Canadian Jamieson	Godfrey	1966-71	816 173 tons	2.44% Cu, 4.22% Zn
Jameland	Jamieson	1969-72	509 356 tons	0.99% Cu, 0.88% Zn
Kam Kotia	Robb	1943-44 1961-72	6.6 Mtons	1.1% Cu, 1.17% Zn, 0.10 oz/T Ag
Kidd Creek	Kidd	1966-	136.181 Mtonnes	2.40% Cu, 6.59% Zn, 0.267% Pb, 82.4 g/t Ag
Langmuir #1	Langmuir	1990-91	111 502 tons	1.74% Ni
Langmuir #2	Langmuir	1972-78	1.1 Mtons	1.43% Ni
McIntyre	Tisdale	1963-82	10 Mtons	0.67% Cu
Redstone	Eldorado	1989-92 1995-96	294 895 tons 10 228 tons	2.4% Ni 1.7% Ni
United Obalski	Godfrey	1966	Produced 240 tons Cu concentrate	

Falconbridge Limited – Montcalm Ni-Cu Project

The Montcalm Project is located in Montcalm Township, 85 km northwest of Timmins. A gabbro-hosted nickel-copper deposit with a mineral resource of 7 018 100 tonnes grading 1.46% Ni and 0.71% Cu has been outlined (Figure 5). To date, approximately 80 000 m of diamond drilling has been completed on the property. This work, combined with underground development via ramp access, has outlined 3 structurally defined zones of mineralization within the differentiated and layered mafic to ultramafic Montcalm gabbroic complex.

Falconbridge acquired the property from Outokumpu Mines Ltd. for $14 million and are completing a feasibility study on the deposit. The pre-feasibility study will include the mining and processing of a large bulk sample. During the year, Falconbridge Limited completed 5433 m of diamond drilling and 676 m of underground development drifting on the Montcalm project.

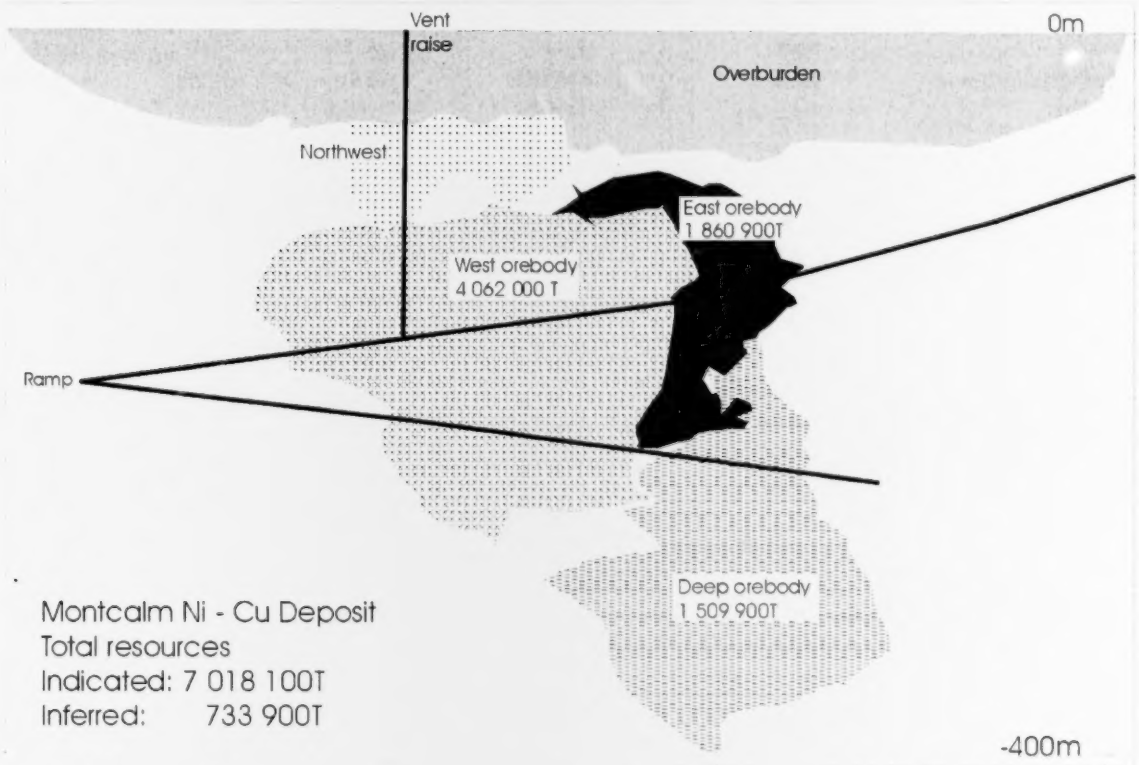

Figure 5. Schematic of the Montcalm nickel-copper deposit, Montcalm Township (*modified from* Falconbridge Limited) indicating the 3 separate ore bodies.

Northcott Gold Inc. – Davidson Tisdale Mine

Northcott Gold Inc. re-opened underground mine working at the Davidson Tisdale Mine in Tisdale Township and commenced de-watering the mine workings with the objective of doing additional underground exploration and development. Surface stripping was completed in the vicinity of the shaft and a new mine dry building was erected on site.

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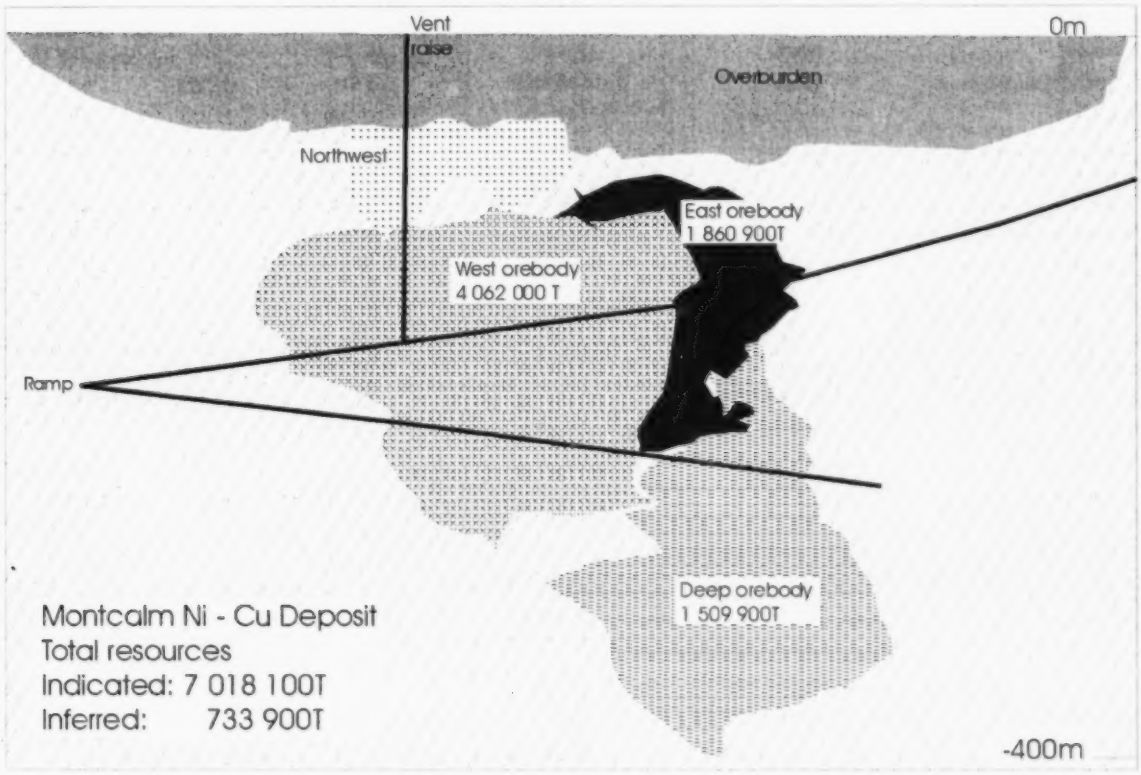

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Northville Gold Corporation, Condor Gold Corp. – Young Shannon Mine

Northville Gold Corporation and Condor Gold Corp. initiated advanced exploration at the Young Shannon Mine property in Chester Township. Underground mine workings were dewatered and ramp access was re-opened in preparation for bulk sampling.

EXPLORATION ACTIVITY

Active exploration projects underway in the Timmins District in the year 2002 are listed in Table 6 with locations indicated in Figures 2c, 2e, 2f and 3. Exploration projects specific to the Wawa area are listed in Table 7 and their locations are indicated in Figure 2g. Highlights of select projects throughout the district are described below.

Arctic Star Diamond Corp. / Iciena Ventures Inc. / Oasis Diamond Exploration Inc. – Enigma Property

In the fall of 2001, the joint venture partners Arctic Star Diamond Corp., Iciena Ventures Inc. and Oasis Diamond Exploration Inc. collected over 300 kg of diamondiferous bedrock from the Enigma property in Menzies Township. A total of 209 diamonds were recovered from 189 kg of bedrock. Two of the diamonds were macrodiamonds. The first, a yellow crystal, measured 0.8 by 0.62 by 0.32 mm and the second, a white fragment, measured 0.58 by 0.38 by 0.16 mm. In order to more fully evaluate the size and shape of the 700 m long diamondiferous source, the partners completed a 6 hole diamond drilling program on the Enigma property in the winter of 2001–2002. Eight microdiamonds were recovered from 485.44 kg of drill core.

An analytical report from C. F. Mineral Research Ltd. states that, based on the presence of diamonds, titanium-rich chromites and other kimberlitic indicator minerals, the lack of lamproitic indicators and geological logging, it concludes that the samples collected from the Enigma property are metamorphosed xenolithic kimberlites and not lamproites or lamprophyres (Arctic Star Diamond Corp., Iciena Ventures Inc. and Oasis Diamond Exploration Inc., press releases, April 23, July 15 and November 20, 2003).

Band-Ore Resources Ltd. and Kennecott Canada Exploration Inc. – GQ Property

Early in 2002, Kennecott Canada Exploration Inc. released the results of their fall 2001 sampling program on the Engagement and Bartlett Lake zones located on the GQ Property, Musquash Township. Sample results, including recent results from 2002 sampling, are summarized in Table 8.

The positive results of the sampling program assisted Kennecott with the design of their 2002 exploration program. In addition to an ongoing program of geological mapping and prospecting in favourable areas, the company engaged in a soil sampling program, mechanical stripping, trenching and washing of outcrops and channel sampling of prospective new targets of heterolithic breccia.

Six new diamond occurrences were discovered over the course of the summer. These include a new breccia zone along the shore of the Magpie River, Area SE-F, area JR-27, New-B and the Rainbow Zone. The most significant results came from the Rainbow Zone where a 54 kg saw-cut channel sample returned 1721 diamonds. Twenty-one diamonds measured larger than 0.5 mm in two dimensions.

By the end of the year, Kennecott had extracted 3 mini-bulk samples weighing 52 tonnes in total from the property, and diamond drilled 2 holes on each of the Engagement and Rainbow zones (Band-Ore Resources Ltd., press releases, April 23, July 11, November 5, December 10, 2002).

Table 6. Exploration Activity in the Timmins District in 2002.

Abbreviations

AEM ..... Airborne electromagnetic survey
Au ..... Gold
AM ..... Airborne magnetic survey
ARES ..... Airborne resistivity survey
Au ..... Gold
Beep ..... Beep Mat survey
BM ..... Base metals
Bulk ..... Bulk sampling
Co ..... Cobalt
Comp ..... Data compilation
Cu ..... Copper
DD ..... Diamond drilling (holes) length in metres
DGP ..... Down-hole geophysics
GC ..... Geochemical survey
GEM ..... Ground electromagnetic survey
GL ..... Geological survey
GM ..... Ground magnetic survey
GP ..... Ground geophysical survey
GPS ..... Global positioning system survey
GT ..... Geotechnical survey
HLEM ..... Horizontal loop electromagnetic survey
HM ..... Heavy mineral sampling
IM ..... Industrial mineral testing and maiketing
IP ..... Induced polarization survey
JV ..... Joint venture
Lc ..... Line cutting
MMI ..... Mobile Metal Ion™ survey
Ni ..... Nickel
OD ..... Overburden drilling
PEM ..... Pulse electromagnetic survey
PGE ..... Platinum group elements
Pr ..... Prospecting
Samp ..... Sampling (other than bulk)
Str ..... Stripping
TEM ..... Transient electromagnetic survey
Tr ..... Trenching
VLFEM ..... Very low frequency electromagnetic survey
Zn ..... Zinc

No.	Company/Individual	Township/Area (Commodity)	Exploration Activity
1	Agnico Eagle Mines Limited	Whitney (Au)	DD (6) 1198 m
2	Band Ore Resources Ltd.	Thornloe (Au)	LC, GEM
3	Big Red Diamond Company	Attawapiskat area (diamond)	HM, AM, OD
4	Big Red Diamond Company	Bradburn (diamond)	Samp., OD (1) 15.5 m
5	Big Red Diamond Company	Hamlet, Emerson (diamond)	GM, HM
6	Canabrava Diamond Corporation	Hellyer (diamond)	AM
7	Canabrava Diamond Corporation	Staples, Casselman (diamond)	DD (1) 35 m
8	Canabrava Diamond Corporation	Tooms (diamond)	AM, DD (1) 210 m
9	Claim Lake Resources Inc.	Zavita, Hutt (Au, BM)	Lc, GL, GM, VLFEM
10	Cameco Inc.	Bristol (Au)	DDH (15) 5609 m
11	Cole, B.L.	Shaw (Au)	IP, VLFEM
12	Comaplex Minerals Corp.	Thorneloe (Au)	DD (1) 323 m
13	De Beers Canada Exploration Inc.	BMA 527 834 area (diamond)	DD (21) 449 m, pre-feasibility study
14	De Beers Canada Exploration Inc.	BMA 527 834 area (diamond)	DD (4) 3 m
15	Eastmain Resources Inc.	Upper Kesagami Lake, Little Kesagami Lake (BM)	DD (8) 1335 m
16	Denton Resources Ltd.	Denton (BM)	DD (4) 1640 feet
17	Echo Bay Mines Ltd.	Macklem (Au)	DD (3) 976 m
18	Explorers Alliance Corporation	Denton (BM)	DD (1) 72 m
19	Falconbridge Limited, Cross Lake Minerals Ltd.	Sheraton (BM)	HLEM, GM, DD (2) 385 m
20	Falconbridge Limited	Reid (BM)	DD (1) 207m
21	Falconbridge Limited	Reid (BM)	DD (3) 635.03 feet
22	First Point Minerals Corporation	Mann (PGE)	DD (3) 468 m
23	Gervais, L.N.	Bristol (Au)	GM, HLEM, Lc
24	Gervais, L.N.	Chester (Au)	Str, Samp,
25	Gervais, L.N.	Jessop, Murphy (diamond, BM)	Lc, Grav
26	Goldaur Resources Inc.	BMA 524 832 (diamond)	AM
27	Gowest Amalgamated Resources Ltd.	North of Feagan Lake	AM, AEM

No.	Company/Individual	Township/Area (Commodity)	Exploration Activity
28	Greenshield Resources Ltd.	Newton (Au)	LC, GEM, DD (6) 1041 m
29	Hedman Resources Limited	Horwood (antigorite)	GL, GM, DDH (26) 1720 m
30	Haire, P.G.	Brower	GC, Lc, Samp
31	Hinzer, J.	Casselman, Swanson (diamond)	GM, GC., OD (9), GM
32	Holmer Gold Mines Ltd.	Bristol (Au)	DD (22) 5200 m
33	Hornby Bay Exploration Limited	Clergue, Stock (Au)	GM, Lc, VLFEM, DD (4)
34	Jerome, A.	Carter	Pr, Samp
35	Kinross Gold Corporation	Cody and Macklem (Au)	IP, GM
36	Kinross Gold Corporation	Tisdale Tp. (Au)	DD
37	Kinross Gold Corporation	Macklem (Au)	DD (59) 33 521.20 feet
38	Liberty Mineral Exploration Inc.	Clergue (BM)	GM
39	Liberty Mineral Exploration Inc.	Langmuir (BM)	DD, Lc, mag
40	Liberty Mineral Exploration Inc.	Whitney (BM)	IP
41	MacDonnell, A.	Heenan	GL, Tr
42	McKinnon, D.	Valentine, Pitt, Kilmer, Hamlet	Str, GL, LC, GM
43	MCK Mining Corp., Baltic Resources Inc	Martison Lake (phosphate)	DD (6)
44	Meunier, D.	Loveland (BM)	Str, DD (1) 275 m, DGP
45	Moneta Porcupine Mines Inc.	Cody (Au)	DD (2) 168.7 m
46	Moneta Porcupine Mines Inc.	German (Au)	DD (1) 506 feet
47	Moneta Porcupine Mines Inc.	Murphy (Au)	DGP
48	Navigator Exploration Corp, Canabrava Diamond Corporation	BMA 527 834 area (diamond)	DD (1) 116 m
49	Northcott Gold Inc.	Tisdale (Au)	Str, Underground mine dewatering
50	Northville Gold Corporation, Condor Gold Corp.	Chester (Au)	Underground mine dewatering
51	Ontex Resources Limited	Deloro (Au, BM)	GM, Lc, VLFEM
52	Opawica Explorations Inc.	Pinard (BM)	Lc, AM, AEM, GM, TEM
53	Pegg, C.C.	Avon	DD (1) 215 m
54	Placer Dome (CLA) Limited	Matheson (Au)	Grav.
55	Porcupine Joint Venture	Tisdale, Whitney (Au)	DD
56	Robert the Bruce Distilleries Ltd.	Crockett (diamond)	GM, Lc
57	Ross, F.J.	Sewell (Au)	Pr, Str, Samp
58	Salo, A.J.	Hoyle	LC, Pros, GL
59	Spider Resources Inc., KWG Resources Inc. De Beers Canada Exploration Inc.	Spider #3 Project (diamond)	Reverse Circulation Drilling (13) 439.3 m
60	Spider Resources Inc., KWG Resources Inc.	Kyle #3 (diamond)	DD, Samp
61	St. Andrew Go'dfields Ltd.	Macklem (Au)	OD (1) 7.3 m
62	Starfire Minerals Inc.	Eldorado (BM)	Lc, GM, HLEM
63	Starfire Minerals Inc.	Langmuir (BM)	GM, HLEM
64	Waseco Resources Inc.	Attawapiskat area (diamond)	AM
65	Young-Shannon Gold Mines, Limited	Chester (Au)	DD (2) 1150 feet

Table 7. Exploration activity in the Wawa area in 2002.

Abbreviations

Bulk ..... Bulk sampling
Comp ..... Compilation
DDH ..... Diamond drill hole(s)
GC ..... Geochemical survey
GL ..... Geological survey
HM ..... Heavy mineral sampling
Lc ..... Linecutting
Pr ..... Prospecting
Samp ..... Sampling (other than bulk)
Str ..... Stripping
Tr ..... Trenching

No	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity
1	Arctic Star Diamond Corp., Iciena Ventures Inc. and Oasis Diamond Exploration JV (Enigma property)	Menzies Tp. (diamond)	DDH (6 holes), samp, diamond analysis
2	Band-Ore Resources Ltd. and Kennecott Canada Exploration Inc. (GQ property)	Musquash Tp. (diamond)	Bulk, diamond analysis, GC, DDH (4 holes), Str, Tr, samp
3	Band-Ore Resources Ltd. (Corbiere property)	Corbiere Tp. (Au, diamond)	GL, Pr, samp
4	Geodex Minerals Ltd. (Fletch–Mathinamcigus property)	Dolson, Echum Tp (diamond)	Str, samp, diamond analysis
5	Gold Insight Resources Ltd.	Bailloquet, Chabanel Tp. (diamond)	HM
6	Golden Goose Resources Inc. (Magino Mine)	Finan Tp. (Au)	DD (17) 2743 m
7	McKinnon D. (Hawkins Gold Project)	Hawkins Tp. (Au)	GL, Str, Tr
8	Patricia Mining Corp. (Island Gold Project)	Jacobson Tp. (Au)	Compilation, resource assessment, samp
9	Pele Mountain Resources Ltd. (Festival Property)	Lalibert Tp. (diamond)	Bulk, GL, Pr, samp, diamond analysis
10	River Gold Mines Ltd. (Eagle River Mine)	Point Isacor area (Au)	DD (8000 m)
11	River Gold Mines Ltd. (Magnacon Project)	Mishibishu Lake area (Au)	DD (7000 m)
12	Spider Resources Inc., KWG Resources Inc, Diagem International Resource Corp. (Wawa Project)	Lalibert, Menzies townships (diamond)	Bulk, Pr, Str, Tr, samp, diamond analysis
13	Strike Minerals Ltd. (Edwards Mine)	Jacobson Tp (Au)	DD (10 000 m)
14	VenCan Gold Corporation (Edwards Gold Property)	Jacobson Tp. (Au)	DDH (7) 1200 m

Table 8. Results released in 2002 for samples taken from the GQ Property, Band-Or Resources Ltd., Wawa.

Area/Zone	Number of Diamonds per Sieve Size Fraction in Microns							
	Sample Weight (kg)	**+150 sieve size**	**+212 sieve size**	**+300 sieve size**	**+425 sieve size**	**+500 sieve size**	**+600 sieve size**	**Total Diamonds Recovered**
Barnett Zone	247	207						207
D-E*	53.24	1	1					2
Engagement Zone	637	7183				33	1	7216
JR-14*	51.8	1						1
JR-27	69.96	19	6					25
New-B*	8	6	1	1				16
Rainbow Zone	54.18	1059	486	134	21	17	4	1721
SE-F	40.7	28	22	3		1	2	56

** partial results*

† information derived from Band-Ore Resources Ltd., press releases, 2002.

Big Red Diamond Company (1387197 Ontario Inc.)

Big Red Diamond Company is a private, Timmins-based company exploring for diamonds in the James Bay Lowland. During the year, the company flew a detailed magnetometer survey at 150 m line spacing covering 21 000 line kilometres between Attawapiskat and the Victor kimberlite pipe. The company has staked numerous claims and completed reconnaissance helicopter-supported stream and till sampling in the area. Over 200 hand-auger samples were obtained for kimberlite indicator mineral analysis from 152 claims the company holds west of Attawapiskat. Subsequently, an additional 36 claims were staked. A regional geochemcal sampling program covering much of the lowlands in Ontario involved the collection and analysis of 700 overburden samples ranging in size from 10 to 70 kg.

Cameco Corporation

Cameco Corporation focussed exploration on their Bristol Township property. Two diamond drilling programs of 5609 m in 15 holes were completed. The drilling tested a number of gold targets on strike with mineralization in the east central part of Bristol Township, previously identified by Placer Dome Inc. Two holes encountered gold mineralization to a depth of 600 m.

Cameco Corporation closed their Sudbury Ontario exploration office at year end.

De Beers Canada Exploration Inc. – Attawapiskat Kimberlites

In concert with exploration at the Victor Project (*see* "Advanced Exploration"), De Beers Canada Exploration Inc. completed diamond evaluation on several kimberlite pipes in the Attawapiskat area. Small bulk samples had been obtained by drilling on the kimberlite pipes in 2001. Results of the work are presented in Figure 6.

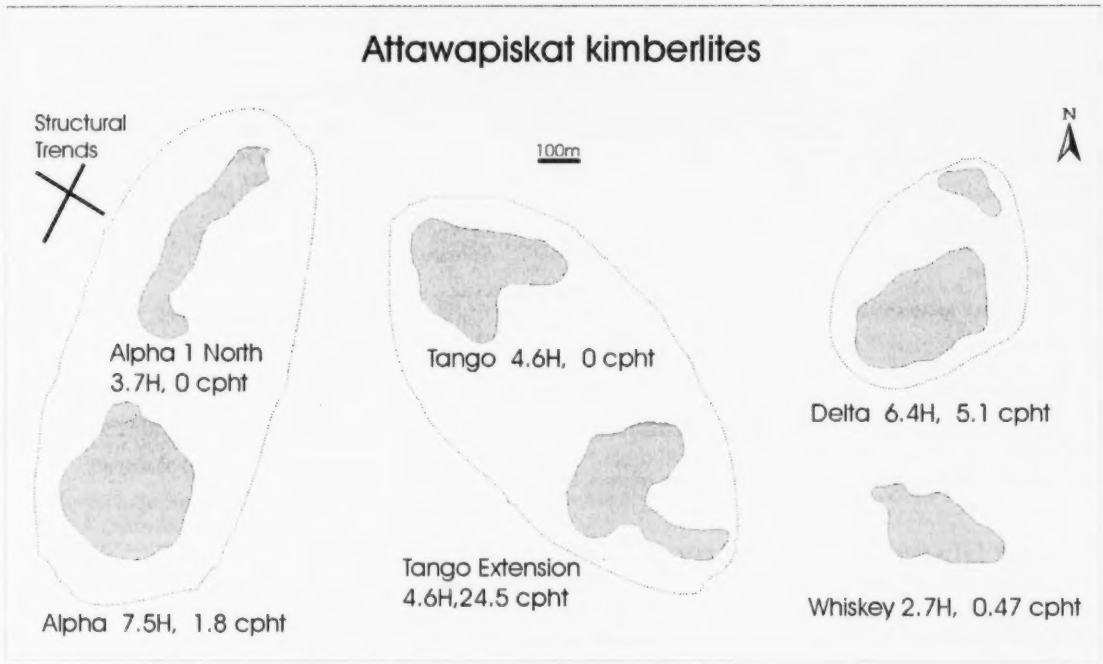


Figure 6. Shape, size (H = hectares), and grade (cpht = carats per hundred tonnes) of select Attawapiskat kimberlites. Information compiled from assessment files, De Beers Canada Exploration Inc.

Falconbridge Limited

In addition to mine development and exploration at the Kidd Creek Mine and the Montcalm nickel copper project, Falconbridge completed surface diamond drilling in Kidd Township consisting of 7 holes totalling 5033 m.The company also did regional exploration that included diamond drilling of 18 holes with a total length of 4035 m. This work targetted geophysical conductors in Prosser, Carnegie, Mahaffy and Reid townships. An airborne MegaTEM electromagnetic survey covered 3275 line kilometres in Mahaffy, Reid, Carnegie, Prosser and Kidd townships. This airborne survey was flown in conjunction with the one flown by the Discover Abitibi Initiative partnership at the same time.

On the optioned Sheraton–Timmins property in Sheraton and Timmins townships, Falconbridge drilled 4 holes with a combined length of 827 m.

Geodex Minerals Ltd. – Fletch–Matchinameigus Property

Early in the year, Geodex Minerals Ltd. acquired 2 properties in Dolson and Echum townships from private owners. The Fletch Property comprises 37 claim units (1600 ha) and covers 4 showings of potentially diamond-bearing host rock. The Matchinameigus Property is contiguous, covers 180 claim units (7200 ha) and initial prospecting identified 3 similar showings. Preliminary petrographic work and microprobe analysis on the showings suggested that the ultramafic rock had kimberlitic affinity (Geodex Minerals Ltd., press release, January 23, 2002). Ultramafic intrusive dike rocks were identified in the area by the Ontario Geological Survey in 1983. Although the rocks were not positively identified as kimberlites, the supporting petrographic and geochemical evidence suggests that the rocks are kimberlitic in nature. Neither of the 2 original occurrences described in the 1983 report have been re-discovered (Downes 1983).

Subsequently, Geodex completed a sampling program on the 2 properties. Five samples were collected from 4 dikes and sent to the Kennecott Canada Exploration Inc. laboratory in Thunder Bay for caustic fusion processing and microdiamond recovery. Two of the dikes returned a single microdiamond each from samples weighing 7.8 kg and 5.3 kg, respectively. The Fletch North dike is 3.2 m wide and contains abundant mantle xenoliths. The No. 2 dike is 2 m wide and does not contain obvious mantle xenoliths. Neither dike has an exposed strike length greater than 10 m (Geodex Minerals Ltd., press release, September 5, 2002).

Golden Goose Resources Inc. – Magino Mine

Golden Goose Resources Inc. completed a 17 hole (2743 m) diamond drilling program on the Magino Mine property in Finan Township. The drill program tested the potential, on strike extensions of the Webb Lake stock as well as geophysical anomalies identified by a 1997 induced polarization survey.

The best assays were obtained from metavolcanic rocks east and west of a mined out area. These include 12.8 g/t Au over 0.67 m and 2.3 g/t Au over 0.46 m. Other significant assays were returned from the Webb Lake stock. Golden Goose has determined that, although the Webb Lake stock has a more widespread and complex distribution than previously thought, the best economic potential for the property appears to be in the area of the current resource estimate (Golden Goose Resources Inc., press releases, June 21 and July 8, 2002).

Hedman Resources Limited – Horwood Township Property

Hedman Resources Limited – Horwood Township property includes claims 1246187 and 1246193 on the east shore of Hardiman Bay of Horwood Lake in Horwood Township (Figure 7). Magnetic surveys and geological mapping were completed, followed by a diamond drilling program of 26 holes amounting to 1720 m. As a result of that work, the company has outlined a mineral resource of 2.1 million tonnes of serpentine, *var.* antigorite. The deposit is estimated to contain less than 0.01% asbestos. The company uses the serpentine mineral under the trade name Hedmanite as an asbestos-free high-temperature mineral product in a variety of industrial mineral applications. An access road was constructed to the site and a small bedrock quarry has been excavated on claim 1946193. A sketch map of the geology of the property in the vicinity of the quarry is presented in Figure 7. A cross-section through the deposit, derived from diamond drilling, is presented in Figure 8.

Navigator Exploration Corp.–Canabrava Diamond Corporation – Kat Project

Navigator Exploration Corp and Canabrava Diamond Corporation completed 1 vertical diamond drill hole to a depth of 116 m on claim 1241241 adjacent to the south boundary of the Yankee kimberlite pipe in the Attawapiskat kimberlite cluster in the James Bay Lowland. The drilling was designed to test the southward plunge of the Yankee kimberlite, but only fractured limestone was encountered.

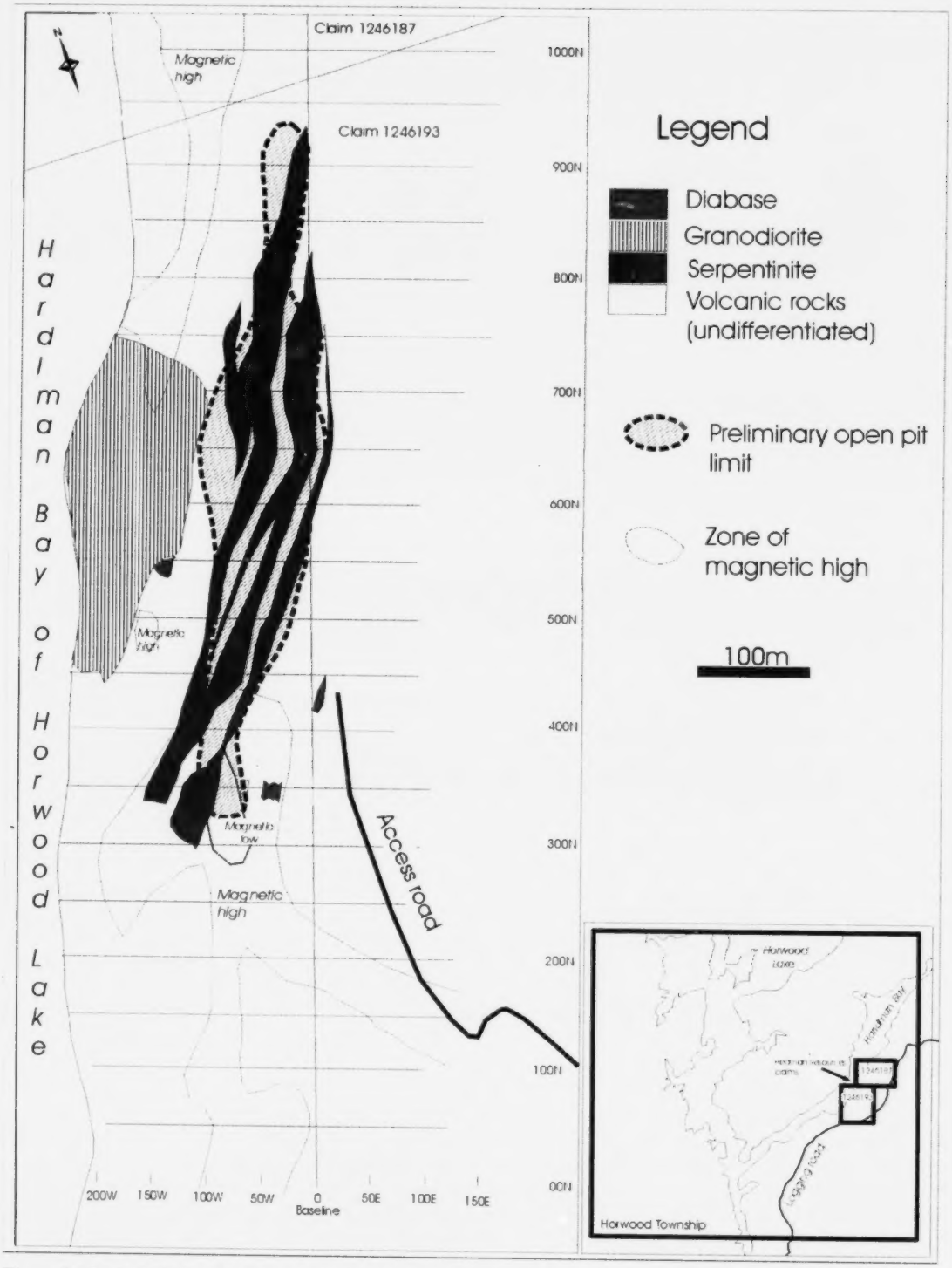


Figure 7. Geological plan of Hedman Resources Limited – Horwood Township property (*modified from* Hedman Resources Limited).

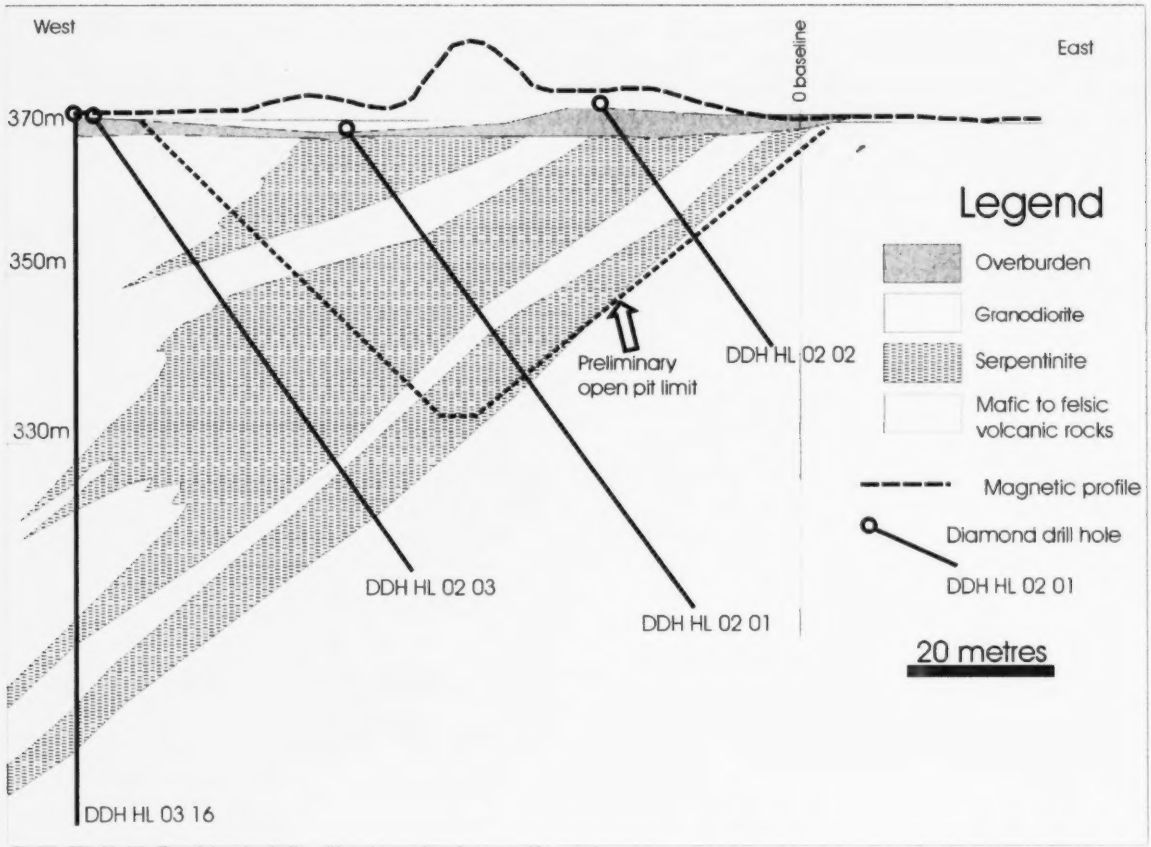


Figure 8. Diamond drill section 600N through the Hedman Resources Limited antigorite deposit, Horwood Township (*modified from* Hedman Resources Limited).

Patricia Mining Corp. – Island Gold Project

Patricia Mining Corp. completed an evaluation of the bulk mining potential of the Goudreau and Lochalsh gold properties in 2002. The evaluation is based on the existing diamond drill core and assay database, comprising over 37 000 m of drilling in 373 holes and 27 000 assays. In addition, the company re-logged the 24 drill holes completed since 1996 and re-assayed sections of the core. Table 9 presents the tonnage and grade for the inferred resource at the Island Gold Project.

Table 9. Inferred resource calculations for Island Gold Project, Jacobson Township.

	Tonnage	Cut Grade (g/t)	Cut Grade (oz/ton)	Ounces
0.75 g/t cut-off grade	20 610 000	2.35	0.07	1 559 000
3.0 g/t cut-off grade	4 210 000	6.00	0.18	815 000
5.0 g/t cut-off grade	2 034 000	8.30	0.24	544 000

†data derived from Patricia Mining Corp., press release, November 12, 2002

The resource calculation includes 6 zones that underlie a 2.0 km section of the southern part of the property. Still to be assessed are areas to the northeast, southwest and to depth along the Goudreau Lake Deformation Zone (GLDZ), as well as eastern and western extensions of the GLDZ. A scoping study has been initiated to review the grade and distribution of the mineralization and to evaluate several mining options for the property (Patricia Mining Corp., press release, November 12, 2002).

Table 10. Results of diamond analysis released for the Festival Property in 2002.

Occurrence	Number of diamonds per sieve size fraction in millimetres											
	Sample Weight (kg)	**0.074 mm**	**0.104 mm**	**0.150 mm**	**0.212 mm**	**0.300 mm**	**0.425 mm**	**0.600 mm**	**0.850 mm**	**1 mm**	**1.18 mm**	**1.70 mm**	**Total Diamonds Recovered**
Cristal 25	20.8	58	43	14	1	1							117
Cristal 26	84.5	299	128	49	6	2				1			485
Deutz	19.3		7*	3	3	1							14
Dom Perignon Central	22.9		49*	55	2	1							107
Dom Perignon North	19.7		31*	19	8								58
Dom Perigonon South	18.3		15*	6	2								23
Genesis	17		120*	92	60	29	5	2					308
Genesis	4500							32	16		4	1	53
Genesis West	19.4		20	17	10	3	1						51
Moet	117.1	26	7	8									41
Mumm	66.2		39	23	10	8	3	1	1				85
Pommery	21		4*	8	4	2							18
Veuve Cliquot	4		4	18	19	6	1						48
Veuve Cliquot	20		13*	6	5	3	1						28

** size fraction reported as recovered from 0.106 mm sieve size*

† information derived from Pele Mountain Resources Ltd., press releases, 2002

Pele Mountain Resources Inc. – Festival Property

Over the course of the 2002 field season, Pele Mountain Resources Ltd. initiated a macrodiamond sampling program designed to prioritize the various diamond occurrences on their Lalibert Township property. Pele Mountain set up an on-site processing facility to extract macrodiamonds from heavy mineral concentrate. The size of the samples ranged from 50 kg up to 2 tonnes. The company will subsequently use the frequency of diamonds per size fraction to prioritize various diamond-bearing facies for future bulk sampling. The facility is configured to recover diamonds less than 6 mm in size and greater than 0.8 mm mesh size (Pele Mountain Resources Ltd., press release, July 2, 2002).

During the summer, Pele Mountain discovered more than 25 volcanic units, (>200 m wide, >800 m long on surface) on the Festival Property. The company also focussed on the mapping and sampling of bedrock in the southwest corner of the property. This area hosts a high concentration of diamond-bearing volcanic units that outcrop intermittently over a 4 km^2 area (Pele Mountain Resources Ltd., press release, October 16, 2002). Table 10 summarizes the results of some of the samples collected and processed during 2002.

Early in 2003, the company announced that a 0.72 carat, white, gem-quality diamond was recovered from a 13 tonne bedrock sample from the Cristal occurrence. The "Big Goose" diamond measures 4.42 by 4.28 by 3.58 mm and was one of 39 commercial-size diamonds recovered from the sample. The total aggregate weight of the commercial-size diamonds is 1.142 carats. The Cristal occurrence is located in the southwest corner of the Festival property. To date, this is the largest diamond recovered from bedrock in the Wawa area (Pele Mountain Resources Ltd., press release, January 22, 2003).

River Gold Mines Ltd. – Magnacon Project

River Gold Mines Ltd. completed a 6600 m surface diamond drilling program on their Magnacon Project, Mishibishiu Lake. The drilling resulted in the discovery of the "Hollinger South" zone, located 4.2 km south of the Magnacon mill. The drilling will provide a systematic evaluation of the property between the Magnacon deposit and the Mishi deposit. Drill hole MM-02-4 returned an assay of 35.96 g/t Au over 2.44 m (14.16 g/t Au cut to 34.28 g/t Au). Gold occurs in white quartz veins with accessory galena and pyrite. The veins are found within a broad south-southeast-striking, north-dipping shear zone that straddles the contact between mafic metavolcanic and metasedimentary rocks (G. Mannard, River Gold Mines Ltd., written communication, 2003).

Spider Resources Inc., KWG Resources Inc. and Diagem International Resource Corp. – Wawa Project

Early in the year, Spider Resources Inc. and KWG Resources Inc. released the results of 3 bulk samples (BK1 through BK3) removed from the Sandor occurrence in 2001. Spider reports that an east-striking dike has been intermittently traced by mapping and sampling for 1 km, to the eastern boundary of the property, where it is evident for another 700 m along the property boundary with Pele Mountain Resources. Discovered in 1995, the Sandor occurrence is the first reported bedrock occurrence of diamonds in the Wawa area. Following the success of these bulk samples, Spider removed 4 more mini-bulk samples (10 000 kg total) from other areas on the property where encouraging diamond results had been obtained. These samples were removed from freshly stripped surface outcrops and are being processed for macro and commercial-size diamond recovery. By the end of the year, only partial results from the first 50 kg test of each sample were reported. The results of all the bulk samples are detailed in Table 11.

In addition to bulk sampling, Spider Resources conducted a field program of regional lithogeochemical sampling, surface trenching and geological mapping. Exploration focussed on 3 high-potential areas on the property. Results from the regional sampling assisted in prioritizing the sites chosen for bulk sampling in 2002 (samples BK-04 through BK-07). Highlights of the 2002 regional samples are shown in Table 12. Of the 92 samples, 8 returned diamond grades in excess of 0.25 carats per tonne (cpt). One sample yielded a grade of 2.617 cpt, based on a 15 kg sample weight.

Table 11. Results released in 2002 for bulk samples taken from the Wawa Project (Spider Resources Inc.).

Bulk Sample Number	Sample Weight (kg)	Commercial Stones	Macrodiamonds
BK-04	50*	115	4
BK-05	50*	63	0
BK-06	50*	102	1
BK-07	50*	9	0
BK1	2410	0	1
BK2	2476	3	5
BK3	2724	8	3

** denotes 50 kg sample split from 2500 kg bulk sample*

† information obtained from Spider Resources Inc., KWG Resources Inc. and Diagem International Resource Corp., press releases, 2002

Table 12. Diamond results for selected reconnaissance samples collected from the Wawa Project (Spider Resources Inc.) in 2002.

Sample Number	Weight (kg)	Total Diamonds Recovered	Total Macrodiamonds	Grade (cpt)
2002-LAL-136	15	4	3	
2002-LAL-139	15	9		0.117
2002-LAL-140	15	2	1	
2002-LAL-142	15	1		
2002-LAL-144	15	39	2	
2002-LAL-145	15	1		
2002-LAL-146	15	35	7	
2002-LAL-148	15	11	1	0.110
2002-LAL-153	15	19		0.223
2002-LAL-156	15	215	5	
2002-LAL-157	15	44	4	
2002-LAL-158	15	48	1	0.570
2002-LAL-168	15	1		
2002-LAL-170	10.16	5		
2002-LAL-172	15	3		
2002-LAL-173	15	9		0.117
2002-LAL-174	15	17		
2002-LAL-176	15	1		
2002-LAL-177	15	1		
2002-LAL-178	15	2	1	
2002-LAL-185	15	64	1	0.427
2002-LAL-190	15	1		
2002-LAL-191	15	13	1	0.103
2002-MEN-137	15	8	2	0.147
2002-MEN-150	15	1		
2002-MEN-151	15	1	1	
2002-MEN-161	15.89	1	1	
2002-MEN-162	15	15	1	
2002-MEN-166	15	5	2	
2002-MEN-167	15	59	22	
LAL 145	15	1	0	
LAL 146	15	33	7	
LAL 153	15	19		
LAL 168	15	1		
LAL 170	15	3		
LAL 174	15	17		
LAL 178	15	2	1	
LAL 190	15	1		
LAL 191	15	13	1	
MEN 162	15	15	1	
MEN 166	15	5	2	
MEN 167	15	59	22	
Total Diamonds		**804**	**90**	

† information derived from Spider Resources Ltd., KWG Resources Inc. and Diagem International Resource Corp. 2002 press releases

Spider Resources Inc., KWG Resources Inc. and De Beers Canada Exploration Inc. Spider #3 Joint Venture, James Bay Lowland

Spider Resources Inc., KWG Resources Inc. and De Beers Canada Exploration Inc. formed a joint venture partnership to explore the Spider #3 project area located west of the Attawapiskat kimberlite cluster. Thirteen reverse-circulation drill holes, totalling 439.3 m, tested select anomalies identified by previously flown airborne geophysical surveys. A vertical drill hole on claim P124329 encountered 11 m of glaciofluvial overburden, 13 m of sediments of the Paleozoic-age Portage Chute Formation and 8 m of Precambrian rocks. The Portage Chute Formation included 8 m of dolomitized limestone, 3.7 m arenitic sandstone, and 1.3 m of mudstone before encountering a 0.2 m section of clay regolith at the Paleozoic–Precambrian unconformity. Although no kimberlite was encountered, the 8 m section of Precambrian rocks carried sulphide mineralization grading 1.61% Cu, 0.34% Zn, 0.13% Pb, 9.9 g/t Ag and 0.13 g/t Au. The Precambrian rocks were intensely altered with hematite, carbonate and chlorite with quartz and carbonate veining. Sulphide minerals included pyrite and chalcopyrite (N. Novak, Spider Resources Inc., personal communication, 2003).

Strike Minerals Ltd. – Edwards Mine

In July 2002, River Gold Mines Ltd. completed the sale of the Edwards Mine (claims 490470 and 490471) and the adjacent Plowman claim (SSM 2183) to Strike Minerals Inc. Between 1996 and 2001, River Gold Mines recovered 140 000 ounces of gold from a total of 387 000 tonnes of ore extracted from only 3 of the 16 identified gold-bearing zones on the property. Strike Minerals estimates that approximately one-third of the original drill-indicated reserves remain on the 3 claims (Strike Resources Inc., press release, May 22, 2002).

Following a review of the previous diamond drilling records of both VenCan Gold Corporation and River Gold Mines Ltd., Strike completed a two-hole diamond drilling program on the Edwards property. The drill program tested 2 zones closest to the existing ramp, the New North One and Two zones. One hole returned grades of 0.077 ounce per ton gold over 4 feet and 0.062 ounce per ton of gold over 2 feet in iron formation. The second hole returned grades of 0.05 ounce per ton gold over 2 feet, 0.108 ounce per ton gold over 2.5 feet and 0.413 ounce per ton gold over 1 foot, all in iron formation. The company plans to further evaluate these zones from underground (Strike Minerals Ltd., press release, September 13, 2002).

By the end of the year, Strike had begun a 13 hole (10 000 feet) diamond drilling program on the Plowman Claim. The program will test the subparallel Plowman #1 and #2 zones. The Plowman #1 Zone has a reported strike length of at least 300 feet and has returned drill intersections up to 2.23 ounce per ton gold over 1.6 feet. The Plowman #2 Zone also has a strike length of at least 300 feet and has returned drill intersections up to 0.807 ounce per ton gold over 1 foot (Strike Minerals Ltd., press release, November 20, 2002).

Timginn Explorations Limited

Timginn Exploration Limited have an option on 13 patented mining claims that cover an area extending from Mountjoy Avenue, Timmins, to Highway 655. The property adjoins the Hollinger Mine, Moneta and McIntyre Porcupine gold mines properties and encompasses Gilles Lake. Fifty-six diamond drill holes, totalling 17 400 m, have been drilled between 1993 and 1998 on the property. The focus of the exploration has been favourable host rocks that were mined for gold at the neighbouring mines. Diamond drilling intersected mafic metavolcanic flows, volcanic breccia and felspar porphyritic intrusive rocks similar to those that host gold on the adjoining properties. A sketch map of the drill holes is presented in Figure 9.

VenCan Gold Corporation – Edwards Gold Property

VenCan Gold Corporation completed a 7 hole (1200 m) diamond drilling program on its Edwards Gold Property in Jacobson Township. The program was designed to test for the westward extension of the Edwards/Cline shear zone on property adjacent to the Edwards Mine. This 43 claim property surrounds the Edwards Mine property on three sides and straddles the Edwards/Cline shear zone. The shear zone remains untested to the east of the Edwards Mine (VenCan Gold Corporation, press release, October 25, 2002).

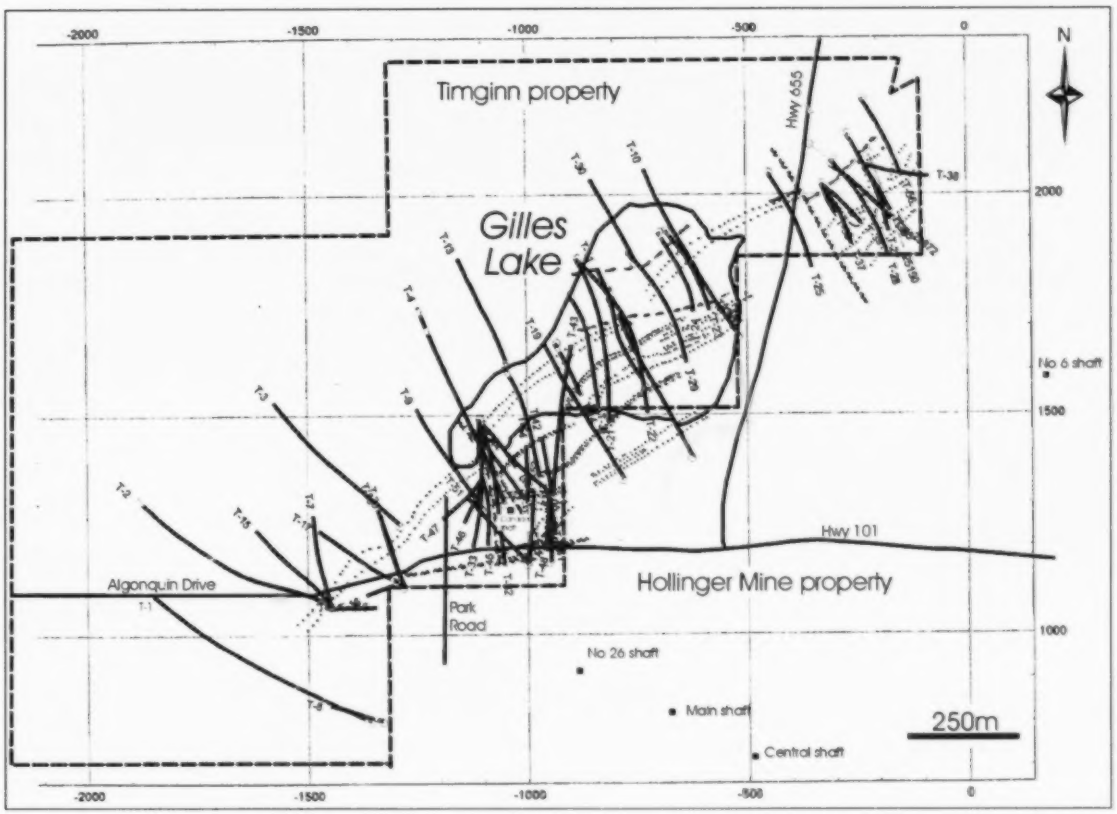


Figure 9. Property outline and diamond drill hole location map in the vicinity of Gilles Lake, Tisdale Township by Timginn Explorations Limited.

RESIDENT GEOLOGIST PROGRAM STAFF AND ACTIVITIES

The Timmins Resident Geologist Office was staffed by B.T. Atkinson, Regional Resident Geologist, A.C. Wilson and G. Wm. Seim, District Geologists, and P. Hope, District Support Geologist. In September, A.M. Koroschetz took up duties as Acting District Support Geologist. A. Labelle and N. Jensen were employed under the Summer Experience Program 2002 as summer students. M. Stalker was hired on a contractual basis for the month of September.

A.C. Wilson provided ongoing field services to clients in the Wawa area through biweekly visits during the field season from May to October.

The Timmins office also serves as the head office for the Northeast Ontario Regional Resident Geologist Program. Activities of staff for the past year are summarized in Table 13. Assessment files and publications received in the Timmins office in 2002 are listed in Tables 17 and 18, near the end of this report.

J. Ireland is the Regional Manager of the Northeastern Ontario Resident Geologist Program. F. Boucher and D. Egerland are the Administrative Assistants, D.M. Draper is the Regional Support Geologist and G. Yule is the Regional Land Use Geologist for Northeastern Ontario.

Table 13. Summary of staff activities, Timmins Regional Resident Geologist Office, 2002.

Activity	
Assessment files received (including donations)	173
Client visits – Office	1021
Client visits – Drill Core Library	26
Geological tours given	13
Geoscience library additions (reports; papers; maps)	52
Property visits by staff	68
Telephone inquiries	2128
MDI records Added	266
MDI records Updated	295
MDI records Deleted	20

PROPERTY EXAMINATIONS

A number of property visits made during the course of the year by office staff are described below. The property visits provide geological insight into the area and help in identifying areas deemed favourable for the discovery of new mineral deposits.

Shenango Alkalic Intrusion

The Shenango alkalic intrusion is located in Shenango, Sherlock and Lougheed townships, approximately 80 km west of Timmins. Several site visits to the complex were made to examine the geological setting of the intrusion and investigate the mineral potential of the area. A secondary objective was to examine an enigmatic magnetic feature encircling the intrusion (Figure 10). Sage (1987) completed a 1:20 000 geological map and detailed geochemical and petrographic analysis of the complex.

Access to the Shenango intrusion is by way of the Oates logging road that intersects Highway 101 approximately 2 km east of Foleyet. The logging road extends for 37 km northwest from the highway, ending at the Canadian National Railroad main line at Shenango Lake. Outcrops along the railroad right-of-way between Summit Lake and Shiners Lake in Shenango Township were examined during traverses through the area.

A variety of syenite through granodiorite intrusive phases were noted in outcrops (Figure 11). Coarse-grained hornblende amphibolite dikes cut brown biotitic syenite along the railway right-of-way between Shiners and Shenango lakes.

Country rocks around the intrusion consist of coarse-grained amphibolite to migmatite gneissic rocks of the Kapuskasing structural zone. Mafic gneiss include abundant red garnet, dark green amphibole, plagioclase and quartz with accessory magnetite.

Recent detailed airborne magnetic surveys covering the area reveal a ring-like feature encircling the intrusion.

From the field investigations, no conclusive determination for the origin of the magnetic ring could be made, but several possibilities include 1) an alteration front related to the emplacement of the intrusion, 2) an accompanying ring dike complex, or 3) the vestiges of a meteorite impact crater.

Whatever the origin of the ring, the spatial relationship to the alkalic intrusion suggests a genetic link. It further provides a quantitative measure of the widespread affect the intrusion has on the country rocks. In this case, the influence of the 4 km diameter intrusion has a regional effect on the surrounding rocks over a distance of 14 km.

Figure 10. Grey-scale magnetic image of the Shenango alkalic intrusion with accompanying circular magnetic feature. Image data provided by D. Tortosa based on Ontario Geological Survey Map 81-710.

Figure 11. Railroad cut through the Shenango alkalic intrusion near Shenango Lake, Shenango Township.

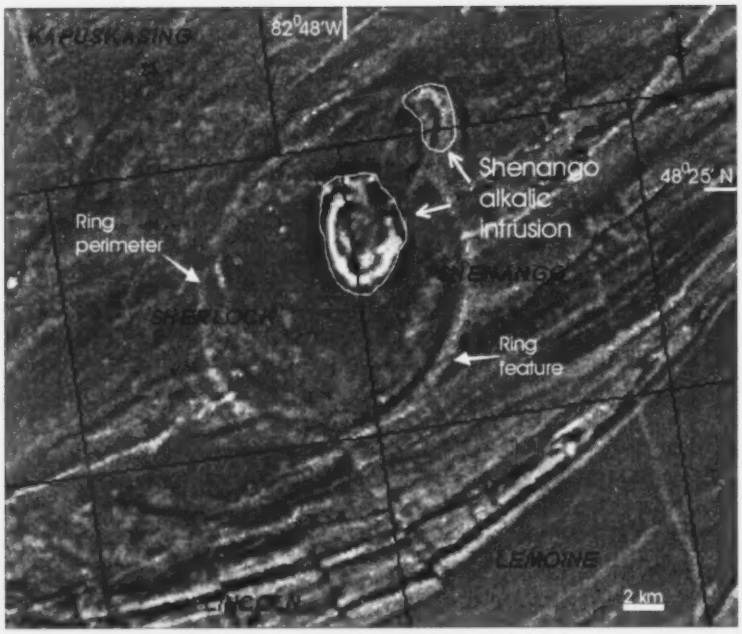


Figure 10. Greyscale magnetic image of the Shenango alkalic intrusion with accompanying circular magnetic feature. Image data provided by D. Tortosa based on Ontario Geological Survey Map 81 710.

Figure 11. Railroad cut through the Shenango alkalic intrusion near Shiners Lake, Shenango Township.

Mineral Prospects and Occurrences in Denton Township

During 2002, a thorough paper search was completed to identify all of the known mineral occurrences in Denton Township. This was done in preparation for a mineral resources assessment that was to be completed on the proposed Tatachikapika River Plain Conservation Reserve using the Provincially Significant Mineral Potential (PSMP) methodology. During spring and summer, several prospects, occurrences, other outcrops and some diamond drill core from the township were examined.

Prior to the paper search, there were 8 mineral occurrence and/or prospect records available for Denton Township in the Mineral Deposit Inventory database. Presently, there are 30 records for Denton Township in the database of which 6 are listed as prospects, 22 are listed as occurrences and 2 are included as discretionary occurrences—mineralization for which assay data is unavailable or does not meet minimum criteria. Most of the new records are relatively recent diamond drill hole intersections, but some resulted from distinguishing geographically separate zones of mineralization that were previously lumped together in the original 8 records. All of the documented mineral occurrences and/or prospects in Denton Township, along with brief descriptions of their geological features, are shown in Figure 12 and listed in Table 14.

Hall and Smith (2002) completed the most recent geological mapping of Denton Township. Their report discusses in detail the geology of the township as well as several of the mineral occurrence and/or prospects and provides some insight into the controls on mineralization. Previously, Choudry (1989) mapped Denton Township, and produced a report that includes descriptions of most of the known mineral occurrences. Others (Ferguson 1959; Harding and Berry 1938; Todd 1923; Rogers and Bruce 1911; Burrows 1911, 1912) have documented the geology and mineralization in Denton Township.

Mineral exploration in Denton Township has, for the most part, focussed on the search for gold mineralization. Gold occurrences and prospects account for 27 of the 30 MDI records. Of the 3 remaining records, 2 document mineralization that suggests the presence volcanogenic massive sulphide (VMS) environments and the third, the potential for magmatic copper-nickel mineralization. Hall and Smith (2002) report an "occurrence" of PGE mineralization in southeast Denton Township. The source for this occurrence is Choudry (1989, *see also* Table 2, p.151) who reports several Pt, Pd values of greater than 1 part per million (ppm). Hall and Smith (2002) and this writer (Seim), separately, resampled the area where Choudry (1989) obtained his best Pt, Pd values. Analytical results from those samples failed to duplicate Choudry's original Pt, Pd results. It is probable that the listing of Pt and Pd values in ppm by Choudry (1989) is a typographical error. The values were most probably reported in parts per billion (ppb).

There are 4 geological associations for gold mineralization in Denton Township.

1. Gold associated with fractures and shear zones within the eastern part of the Carlton Lake Pluton (e.g., Aumo occurrence).
2. Gold associated with fractures and shear zones in supracrustal rocks near the southern contact of the Carlton Lake Pluton (Brown–McDade prospect).
3. Gold associated with syenitic, quartz-feldspar porphyritic intrusions (Battle Mountain DDH MC97-26).
4. Gold associated with regional deformation and/or shear zones (Halpenny, McCoshen, Cripple Creek Zone 16 and Cripple Creek Zone 17 occurrences).

GOLD ASSOCIATED WITH FRACTURES AND SHEAR ZONES WITHIN THE EASTERN PART OF THE CARLTON LAKE PLUTON

Early prospecting identified several zones of gold mineralization within the eastern part of the Carlton Lake pluton. These zones appear to have 2 orientations: north-trending: perpendicular to the southern contact of the pluton, and east-trending: parallel to the southern contact of the pluton.

The north-trending zones are located in northern Denton Township and the southern part of Carscallen Township. Most zones were traced by early prospecting, sometimes for a few hundred metres, but tended to be very narrow, and mineralization was very erratic. Analytical data for these zones is sparse at best and most of the zones are

discretionary occurrences in the MDI database. The Jowsey–Denton prospect (formerly part of the Brown–McDade prospect) is the most advanced of these zones, being exposed on surface and intersected by diamond drilling. Other examples of this type of mineralization are the Hazelton Vein No. 1 and the Jowsey Vein. The Jowsey Vein is exposed in outcrop about 700 m north of Highway 101 on the west side of a north-trending gravel road. The 1010 Vein (in Carscallen Township) described by Hall and Smith (2002) as the Jowsey Prospect is also a discretionary occurrence of this type.

The Aumo Prospect – No. 2 and No. 5 veins are the best-known examples of gold mineralization hosted in east-trending (parallel to the southern contact of the pluton) fractures and/or shear zones. These quartz-tourmaline-sulphide veins, though narrow, are persistent over considerable lengths and have good gold tenor. Sulphides present include pyrite, chalcopyrite and arsenopyrite. Discrete shear zones host the quartz veins. There is a rapid decrease in the intensity of foliation, sericitization and sulphidation within the granodioritic host, away from the contacts of the veins.

GOLD ASSOCIATED WITH FRACTURES AND SHEAR ZONES IN SUPRACRUSTAL ROCKS NEAR THE SOUTHERN CONTACT OF THE CARLTON LAKE PLUTON

The Brown–McDade Prospect and the Golden Range Resources Area # 4 occurrence are the 2 known examples of this style of gold association. According to Hall and Smith (2002), the area containing this prospect and occurrence is underlain by a segment of gabbro belonging to the Kamiskotia gabbroic complex. Choudry (1989) and other mineral industry geologists have interpreted the rocks underlaying the Brown–McDade prospect as massive and pillowed imtermediate to mafic metavolcanic flows and the rocks underlaying the Golden Range Resources Area # 4 occurrence as intermediate pyroclastics.

At the Golden Range Resources Area # 4, a north-trending, shear-hosted quartz-sulphide vein hosts the gold mineralization. The reported sulphides are pyrite, arsenopyrite and sphalerite. The wall rocks are silicified and sericitized.

The Brown–McDade prospect includes at least a few zones of gold mineralization, some known only through diamond drilling. The Main Zone is a quartz-sulphide vein contained within a north-northeast-trending shear zone. Silicification is reported in the wall rocks and the sulphides present include pyrite, pyrrhotite, arsenopyrite and chalcopyrite. A 1048 ton bulk sample from the Main Zone was extracted in 1982 and averaged 0.14 ounce per ton gold.

About 125 m north of the Main Zone, cherty quartz veins hosted in east-trending, contact-parallel shear zones, also contain gold. This mineralization occurs very near to the contact of the Carlton Lake pluton.

Gold mineralization intersected in Prospectors Alliance diamond-drill hole PA 97-4 and PA97-5 may also be of this association.

The gold mineralization occurring both in the Carlton Lake Pluton and within the supracrustal rocks near its contact is contained in north-trending (radial) and in east-trending (concentric) shear zones and/or fracture systems. The development of these radial and concentric shear zones and/or fracture systems may reflect a strain aureole created/activated by the emplacement of the pluton itself (Fyon et al. 1992). As such, these associations for gold mineralization present targets separate from those normally associated with the Porcupine–Destor fault zone in the Timmins camp.

GOLD ASSOCIATED WITH SYENITIC, QUARTZ-FELDSPAR PORPHYRITIC INTRUSIONS

In the very northeast part of Denton Township and adjoining parts of Bristol Township and Thornloe Township, Battle Mountain Canada Ltd. completed several diamond-drill holes that intersected multiple, syenitic, quartz-feldspar porphyritic intrusions (dikes and/or sills). Three diamond-drill holes completed in Denton Township returned narrow intersections of occurrence-grade gold. The gold occurs in weakly pyritized quartz veined zones, both within the porphyritic intrusions and the adjacent wall rock. The intrusions and the mafic metavolcanic wall rock are variably hematized, sericitized and silicified. Epidote and sausserite are also noted alteration minerals found in the area.

The Karvinen Occurrence in central Denton Township may also be gold associated with porphyritic intrusions.

At present, the structural relationship of gold mineralization associated with syenitic, quartz-feldspar porphyritic intrusions in Denton Township is not certain.

GOLD ASSOCIATED WITH REGIONAL DEFORMATION AND/ÓR SHEAR ZONES

Hall and Smith (2002) identify the Porcupine–Destor fault zone (north zone and south zone) (PDFZ), the Scott shear and the McCoshen splay (of the Scott shear) as the prominent deformation/shear structures in Denton Township. In the Timmins gold camp, much gold mineralization is associated with faults and shears zones interpreted as splays off of the PDFZ. The relationship of the Scott shear and the McCoshen splay to the PDFZ is unclear. Hall and Smith (2002) interpret the mylonite zones of the PDFZ to be older than the Scott shear and the McCoshen splay. However, Hall (L.A.F. Hall, OGS, personal communication, January 2003) does not rule out a genetic relationship and notes that the PDFZ had a protracted deformation history.

Fourteen gold occurrences and prospects define a 2 km wide, east-northeast-trending band that is centred on the trace of the Scott shear. A northeastward extension of this band encompasses all occurrences of the syenitic, quartz-feldspar porphyry intrusion association. Foliation at the Halpenny prospect and in the area of the Karvinen occurrence is east-striking. These 2 zones of gold mineralization are more likely associated with the northern branch of the PDFZ than with the Scott shear.

Ultramafic to mafic metavolcanic rocks host all 14 gold occurrences and prospects. Where observed on surface (McCoshen occurrence, Halpenny prospect, Karvinen occurrence and the Cameco ladder-vein trench), the metavolcanic rocks are highly strained. The "gold-bearing" veins are typically boudinage, and folded (z-shaped), sometimes to the point where they can be described as ptygmatic. The veins are usually quartz-carbonate-sulphide veins, but, in some locations, only sulphides are evident. Pyrite and arsenopyrite are the most common sulphides observed and chalcopyrite, sphalerite and galena are also frequently present. Ankeritic carbonatization is the most pervasive alteration. Evidence of silicification, sericitization and, less frequently, albitization is often observed.

Location, with respect to the prominent shears and the PDFZ, may be an important factor in the definition of mineralized zones or shoots. The veins and mineralization at the McCoshen occurrence, Halpenny prospect, and Cameco ladder-vein trench are boudinage and individual vein segments have very short lengths. This style of mineralization is believed to be in areas of most intense deformation and explorationists to date have had difficulty defining gold-bearing zones. The trends of the PDFZ and the Scott shear diverge to the east. It is not unreasonable to expect the intensity of deformation to decrease away from these deformation zones and that gold-bearing zones in the area between the PDFZ and the Scott shear may have more continuity in the less deformed rocks. Although not certain, this may be the case for Cripple Creek Zone 16 and Cripple Creek Zone 17, the 2 prospects exhibiting the greatest continuity.

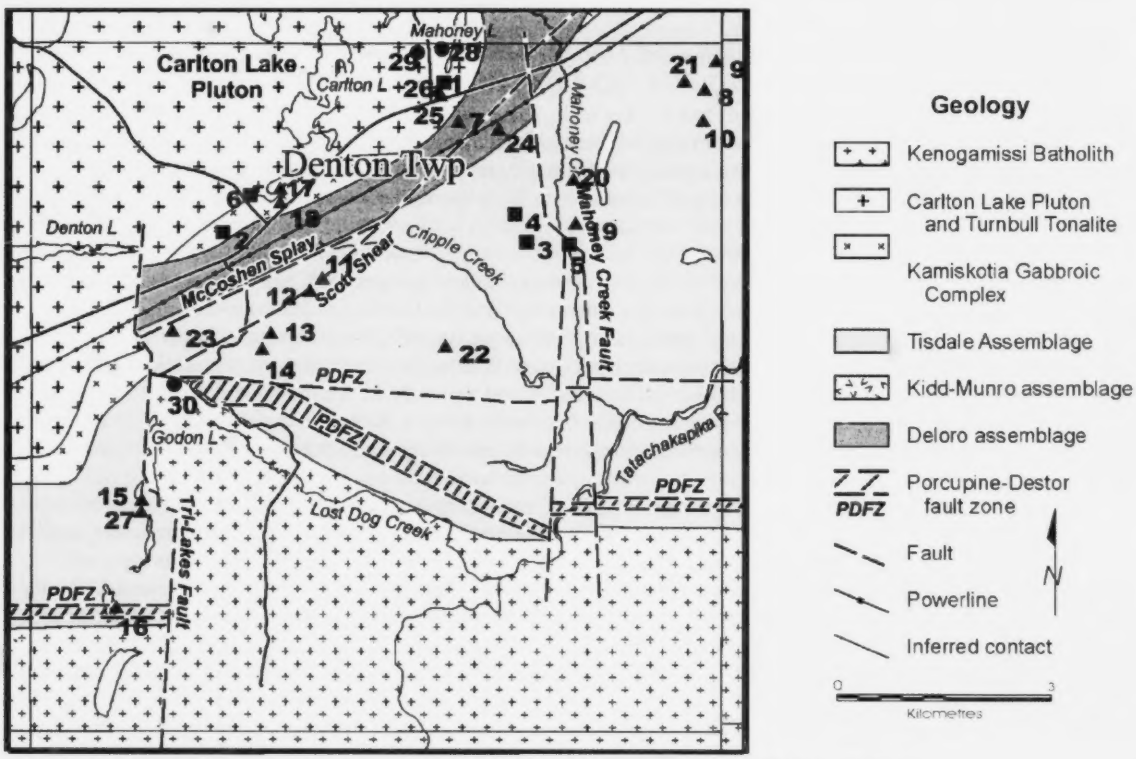
BASE METAL OCCURRENCES

There are 2 zinc-copper (Zn-Cu) occurrences and a nickel (Ni) occurrence in Denton Township. The geology of both Zn-Cu occurrences suggests volcanogenic massive sulphide (VMS) environments. At the Aumo #3 occurrence, the Zn-Cu mineralization occurs in an interflow graphitic, argillaceous metasedimentary unit within a succession of mafic to felsic metavolcanic rocks. There may be a gold overprint at this location. Denton Resources diamond-drill hole 9813 intersected Zn-Cu mineralization in a cherty interflow metasedimentary unit within a predominantly mafic metavolcanic succession. Further work is needed to determine if the geological environment is truly prospective for VMS mineralization.

The nickel occurrence is found in serpentinite. At a grade of 0.11% Ni, it is not certain if the nickel occurs in sulphide (pyrite) or is caught up in the silicate minerals. A more substantive nickel intersection was reported in Denton Township, but documentation of the intersection was not found.

THE NAMING OF MINERAL OCCURRENCES AND PROSPECTS

The names of mineral properties change through time as they pass from prospector to company to company. The same zone of mineralization is often known by several different names. The Halpenny prospect is also known as the Mahoney Creek, and Gowest. To further confuse matters, 2 different companies may give 2 different mineralized zones on their respective properties the same name. There are several Jowsey occurrences in Denton and Carscallen townships. Consequently, the name a reader may use for a mineralized zone may be different than that used in the MDI database. Generally, the name used in the MDI database reflects the original name given a mineralized zone by the discoverer or the name most commonly used in the documenting of the zone.



■ Prospects 1 - Aumo; 2 - Brown-McDade; 3 - Cripple Creek Zone 16; 4- Cripple Creek Zone 17; 5 - Halpenny, R E.; 6 - Jowsey-Denton

▲ Occurrences 7 - Aumo No. 3 Vein; 8 - Battle Mountain DDH MC97-21; 9 - Battle Mountain DDH MC97-22; 10 - Battle Mountain DDH MC97-26; 11 - DE#1-4-85; 12 - DE#1-6-85; 13 - DE#1-7-85; 14 - DE#1-8- 85; 15 - Denton Resources DDH9809; 16 - Denton Resources DDH9813; 17 - Golden Range Resources Area # 4; 18 - GRD-86-6; 19 - Hemlo Gold CC93-1; 20 - Hemlo Gold CC95-13; 21 - Hollinger DDH M-6; 22 Karvinen; 23 McCoshen; 24 - Prospectors Alliance DDH PA97-2; 25 - Prospectors Alliance DDH PA97-4; 26 - Prospectors Alliance DDH PA97-5; 27 - Dodds T.

● Discretionary Occurrences 8 - Hazelton Vein No. 1; 29 - Jowsey Vein; 30 - Scott

Geology from Hall and Smith (2002)

Figure 12. Location map of mineral occurrences in Denton Township.

Table 14. The mineral prospects and occurrences in Denton Township.

MDI Number **Deposit Name** **Deposit Status** **Alternate Name(s)** **UTM Easting, UTM Northing,** **Commodity(ies)**	**Description**	**Best Result** **Alteration** **Minerals/Assemblages** **Ore/Gangue Minerals**
MDI42A05SE00028 Aumo Prospect Aumo No. 2 and No. 5 veins Hazelton No. 2 vein 452000 E 5356200 N Gold, Silver, Copper, Molybdenum	The Aumo prospect consists of the No. 2 and No. 5 veins. These veins occur in shear zones that strike 265°/75°N to 285°/75° through the Carlton Lake pluton, a granodioritic intrusion. The veins occur near the southeast contact of the pluton with mafic metavolcanic flows. The tonalite-quartz diorite is xenolith rich and exhibits epidote and sausserite alteration. Pyrite and chalcopyrite occur disseminated and in stringers within the granodioritic rock. The veins are narrow (<50 cm on average). The No. 2 vein, a quartz-tourmaline-sulphide vein, was traced on surface and though diamond drilling for at least 350 m. The quartz is white, fractured and ribboned with chlorite and tourmaline. Pyrite and chalcopyrite, the principle sulphides present in the vein, occur disseminated and in stringers along fractures and locally as massive concentrations within the vein.	No. 1 Lens -- 26631 tonnes @ 9.16 g/t Au, No. 2 Lens -- 11941 tonnes @ 7.4 g/t Au Epidote, Sausserite Pyrite, Chalcopyrite, Pyrrhotite, Arsenopyrite.
MDI42A05SE00043 Brown–McDade Prospect Denton 4-83 Detail Grid B 448890 E 5354072 N Gold, Silver, Copper	The main zone occurs within altered basalt flows. It consists of quartz-carbonate veining in a shear zone striking 030°. The shear zone and quartz vein are mineralized with pyrite, arsenopyrite and pyrrhotite. About 125 m to the northeast of the Main Zone, drilling by Hollinger Argus further intersected several bluish quartz veins in silicified (andesite) basalt. The quartz veins are mineralized with pyrite, pyrrhotite and chalcopyrite. About 125 m to the north of the main zone, cherty quartz veins in andesite near the contact with the Carlton Lake pluton yielded occurrence-grade gold assays.	0.14 ounce per ton gold returned from 1038 ton bulk sample Silicification Arsenopyrite, Chalcopyrite, Pyrite, Pyrrhotite
MDI42A05SE00056 Cripple Creek Zone 16 Prospect Battle Mountain Gold DDH CC96-16 453160 E, 5353940 N, Gold	Luhta et al. (1996) report that the 16 Zone is a series of altered mafic metavolcanic bands up to 6 m wide, but on average 1 to 2 m wide within a carbonatized ultramafic horizon. These mafic bands contain the gold mineralization and are carbonatized, sericitized, albitized and silicified. They contain up to 15% pyrite and minor arsenopyrite.	3.476 g/t over 14.5 m Carbonatization, Sericitization, Albitization, Silicification Gold, Arsenopyrite, Pyrite
MDI42A05SE00057 Cripple Creek Zone 17 Prospect Battle Mountain DDH CC96-17 452999 E, 5354330 N, Gold	Luhta et al. (1997) report that the 17 Zone occurs at the contact between mafic metavolcanic rocks to the north and carbonatized ultramfic rocks to the south. Gold mineralization occurs in the mafic rocks which contain disseminated pyrite and are carbonatized, sericitized, silicified and slightly hematized.	4.40 g/t Au over 7.0 m Carbonatization, Sericitization, Silicification, Hematization Pyrite
MDI42A05SE00005 Halpenny, R.E. Prospect Mahoney Creek 453765 E, 5353903 N Gold	The Halpenny prospect is located within a series of intercalated mafic (tholeiitic) and komatiitic metavolcanic flows. These are typically overturned and strike about 240°/60°. The metavolcanics are overlain by clastic metasediments to the south. Diabase dikes intrude all lithologies and strike 330° to 360°, but have been offset by local perpendicular faulting. The Halpenny prospect is exposed in a large stripped area (17 by 115 m) to the east of Mahoney Creek. Mafic metavolcanic and ultramafic rocks outcrop in the stripped area. These are thoroughly altered: the mafic metavolcanic rock to chlorite-iron carbonate schist and the ultramafic rock to chlorite-talc-iron carbonate schist. To the east of a wide diabase dike, the schistosity strikes 270°/60°. Crenulation of the schistosity occurs in the ultramfic rock about an axis of 030°/60°. Narrow, quartz-carbonate±pyrite±chalcopyrite veins occur both in the mafic and the ultramafic rocks. The veining cuts across the schistosity at 245°/80°. To the west of the diabase dike, the schistosity strikes 310°/70°. Wider, more persistent quartz veining occurs in the chlorite-talc-carbonate schist toward the west end of the stripped area near Mahoney Creek. Some quartz veins carry significant concentrations of arsenopyrite.	6.6 g/t Au over 4.6 m Carbonitization, Steatitization Arsenopyrite, Pyrite, Chalcopyrite

MDI Number **Deposit Name** **Deposit Status** **Alternate Name(s)** **UTM Easting, UTM Northing,** **Commodity(ies)**	**Description**	**Best Result** **Alteration** **Minerals/Assemblages** **Ore/Gangue Minerals**
MDI42A05SE00030 Jowsey–Denton Prospect Denton 4-83 Detailed Grid A Brown–McDade Option 449275 E, 5354600 N Gold	This prospect consists of quartz-carbonate-sulphide veins contained in sheared and altered quartz diorite of the Carlton Lake Pluton. The shearing and veins apparently trend 025°/60°. The sheared granodioritic rock is silicified and carbonatized	0.297 opt Au over 22.8 feet Carbonatization, Silicification Pyrite, Pyrrhotite, Chalcopyrite
MDI42A05SE00044 Aumo No. 3 Vein Occurrence Hazelton Veins No. 4 and No. 5 452200 E, 5355650 N Zinc, Copper, Gold	J.E. Hawley (1926) decribes the Hazelton Veins No. 4 and 5 as occurring in a 15-foot band of Keewatin schist. This band includes light-grey sericitic to dark and slaty schists. No definite vein system could be seen at the surface at the time. Portions are well mineralized with sulphides, pyrite, chalcopyrite and pyrrhotite. Hazelton Porcupine Gold Mines Ltd. diamond-drilled 3 holes totalling 905 feet across these "veins". The drilling reportedly encountered several mineralized zones of schist, bands of feldspar porphyry (a phase of the granite) and a graphite seam or fault mineralized with pyrite, one of the holes ended in grey granite or granite porphyry. According to Choudry (1989), Aumo Porcupine Gold Mine Ltd.'s No. 3 Vein is entirely within the metavolcanics and was intersected following a graphitic shear zone that may have originally been a lens of slaty metasediments. The mineralization is largely coarse pyrite. There are sections in the felsic metavolcanic rocks that are heavily mineralized with pyrrhotite and chalcopyrite that yielded low gold values. The best values were found in the graphitic zone where it is heavily mineralized with massive pyrite in blebs and seams. The pyrite makes up to 20% of the mineralized zone and values in this zone varied between 0.06 and 0.30 ounces Au per ton. In 1998 and 1999, Explorers Alliance Corporation diamond-drilled 3 holes that cut mafic to felsic metavolcanic rocks described as tuffs. Two of the 3 drill holes intersected a unit described as felsic tuff/argillite/quartz veining. This unit carries semi-massive sulphides including pyrrhotite, pyrite chalcopyrite and sphalerite.	8960 ppm Zn and 1100 ppm Cu over 1.2 m (diamond drill intersection) and unconfirmed gold values up to 0.30 opt Au Sericite Pyrite, Pyrrhotite, Chalcopyrite, Sphalerite
MDI42A05SE00059 Battle Mountain DDH MC97-21 Occurrence 455660 E, 5356110 N, Gold	Diamond-drill hole MC97-21 intersected a succession of mafic metavolcanic rocks intruded by many phases of feldspar porphyry. The porphyry is often hematized and silicified. The intersection occurs within silicified mafic metavolcanic rock with quartz veining and weak pyrite mineralization.	0.58 g/t Au over 1.5 m Hematization, Silicification Pyrite.
MDI42A05SE00060 Battle Mountain DDH MC97-22 Occurrence 455825 E, 5356510 N Gold	Diamond-drill hole MC97-22 intersected a succession of mafic metavolcanic and ultramafic rocks. The interval from 111.1 m to 111.60 m (0.50 m) returned an assay value of 0.83 g/t Au. This interval contained a low angle quartz vein (10 degrees to C.A.) that bleached the mafic metavolcanic wall rock for up to 2 cm. The interval contained up to 15% coarse, euhedral, and finely disseminated pyrite.	0.83 g/t Au over 0.5 m No alteration noted Pyrite
MDI42A05NE00114 Battle Mountain DDH MC97-26 Occurrence 455640 E, 5355670 N Gold	Diamond-drill hole MC97-26 cut a succession of pillowed and massive mafic metavolcanic flows that are cut by numerous feldspar porphyry dikes. The dikes are typically narrow (<1.0 m), but may comprise up to 50% of a 5 m section of core. The mafic metavolcanic rocks have been variably epidotized, sericitized, silicified, saussecritized, and hematized presumably in relation to the injection to the porphyry. The porphyry dikes are logged as pink to brick red in colour, and of fine-grained syenitic composition to coarse-grained, perthitic with zoned feldspars. Many of the assayed intervals within the hole returned >200 ppb Au with 5 intervals returning values >1 g/t Au. These 5 intervals sampled both hematized mafic metavolcanic rock and porphyry. Minor quartz veining and low concentrations of pyrite are associated with the gold-bearing intervals.	1.29 g/t Au over 2.10 m Epidote, Sericite, Saussecrite, Hematite, Silicification Pyrite

MDI Number **Deposit Name** **Deposit Status** **Alternate Name(s)** **UTM Easting, UTM Northing,** **Commodity(ies)**	**Description**	**Best Result** **Alteration Minerals/Assemblages** **Ore/Gangue Minerals**
MDI42A05SE00049 DE#1-4-85 Occurrence Labrador Mining and Exploration Co. 450300 E, 5353425 N Gold	Diamond-drill hole DE#1-4-85 collared through 22.7 m of overburden. The drill hole cut mafic tuffs and flows, ultramafic flows and intermediate flows. The hole cut a silicified shear zone from 49.1 to 65.0 m, 9.0 m of which returned anomalous gold values.	1235 ppb Au over 1.0 m Ankerite, Sericite, Chlorite, Silicification Arsenopyrite, Pyrite,
MDI42A05SE00046 DE#1-6-85 Occurrence Labrador Mining and Exploration Co. 450125 E, 5353250 N Gold	Diamond-drill hole DE#1-6-85 collared through 22 m of overburden. The drill hole then cut carbonate-sercite-chlorite schist for most of its length with short inervals described as altered mafic flow, ultramafic flow and intermediate flow. The mineralized zone is described as 65% quartz-ankerite veining, 8% pyrite, and 3% arsenopyrite.	0.152 ounce per ton gold over 0.5 m Ankerite, Sericite, Chlorite, Silicification Arsenopyrite, Pyrite
MDI42A05SE00047 DE#1-7-85 Occurrence Labrador Mining and Exploration Co. 449575 E, 5352650 N Gold	Diamond-drill hole DE#1-7-85 collared through 33 m of overburden and cut through carbonate sericite schist, carbonate-chlorite schist, mafic flows, ultramafic flows and intermediate flows. An occurrence-grade gold assay was returned from a 1 m interval of carbonate-chlorite schist containing 25% quartz veining.	0.36 ounce per ton gold over 1.0 m Ankerite, Sericite, Chlorite, Silicification Arsenopyrite, Pyrite
MDI42A05SE00048 DE#1-8-85 Occurrence Labrador Mining and Exploration Co. 449450 E, 5352425 N Gold	Diamond-drill hole DE#1-8-85 collared thorugh 25 m of overburden before cutting through mafic flows, sericite-chlorite schist, carbonate-sericite schist, talc-chlorite schist. An occurrence-grade gold value was returned from a 0.5 m interval in carbonate-sericite schist containing quartz veining.	0.202 ounce per ton gold over 0.5 m Ankerite, Sericite, Chlorite, Silicifiaction Arsenopyrite
MDI42A05SE00042 Denton Resources DDH9809 Occurrence 447750 E, 5350300 N Gold	Diamond-drill hole DDH 9809 encountered sheared, sericitic intermediate to mafic metavolcanic flows through much of its length with the rock becoming more chloritic towards the end of the hole at 306 feet. The shear fabric was at a low angle to the core axis through much of the hole (<20°). Occurrence-grade gold values were returned for 2 intervals containing quartz-carbonate stringers with up to 5% pyrite. Six other diamond drill holes were drilled in the immediate vicinity of 9809, but these did not intersect occurrence-grade gold mineralization.	7.73 g/t Au over 2.0 feet Sericite, Carbonate, Chorite Pyrite
MDI42A05SE00052 Denton Resources DDH9813 Occurrence 447390 E, 5348775 N Zinc, Copper	Diamond-drill hole DDH9813 intersected mafic to intermediate metavolcanic flows with cherty interflow sedimentary beds and inturded by mafic to felsic dikes. One of several cherty interflow sedimentary beds intersected in the drill hole, the interval from 245.65 to 249.8 feet reportedly contained up to 15% pyrrhotite, 7% chalcopyrite, 5% sphalerite and 3% pyrite.	0.52% Zn and 0.128% Cu over 3 feet No alteration noted Pyrrhotite, Chalcopyrite, Sphalerite, Pyrite
MDI42A05SE00050 Golden Range Resources Area # 4 Occurrence 449700 E, 5354700 N Gold	Power stripping exposed a quartz vein for 9 m. A very narrow shear zone trends 003°/80° and hosts the quartz vein. The vein pinches and swells between 20 and 60 cm. The vein selvages are highly sheared, silicified and sericitized and contain up to 1% pyrite and much limonite. The vein itself is white to grey white, containing 5% to 25% pyrite, up to 3% arsenopyrite and up to 4% sphalerite. The sulphides occur in a semibanded orientation, parallel to the vein. The wall rock to the vein/shear is a tuff breccia that has a mafic (predominatnly hornblende and chlorite) matrix hosting white felsic fragments.	2917 ppb Au for a grab sample Sericitization, Silicification Pyrite, Arsenopyrite, Sphalerite
MDI42A05SE00051 GRD-86-6 Occurrence 449700 E, 5354500 N Gold	Diamond-drill hole GRD-86-6 collared through 67 feet of overburden before cutting a succession of intermediate tuff, chloritic tuff, sericite schist and graphitic sediments. An interval of graphitic schist containing pyrite nodules and quartz-ankerite-pyrite veins returned an occurrence-grade gold value.	570 ppb Au over 2.4 feet No alteration noted Pyrite

MDI Number **Deposit Name** **Deposit Status** **Alternate Name(s)** **UTM Easting, UTM Northing,** **Commodity(ies)**	**Description**	**Best Result** **Alteration Minerals/Assemblages** **Ore/Gangue Minerals**
MDI42A05SE00058 Hemlo Gold CC93-1 Occurrence 453850 E, 5354210 N Gold	Hemlo Gold Mines Ltd. completed a total of 7 diamond-drill holes in the immediate vicinity of this occurrence. Four of the holes, including the first, CC93-1, intersected occurrence-grade gold mineralization. Each hole intersected a succession of intercalated mafic and ultramafic metavolcanic rocks altered to chlorite schist and talc-chlorite schists, respectively. The lower portion of CC94-5 returned the widest intersection. The gold-bearing zones contain local albitized intervals mineralized with pyrite and arsenopyrite.	5.77 g/t Au over 2.8 m Albitization, Talc, Chlorite Pyrite, Arsenopyrite
MDI42A05SE00053 Hemlo Gold CC95-13 Occurrence 453825 E, 5354830 N Gold	Diamond-drill hole CC95-13 intersected a succession of ultramafic rock intercalated with mafic metavolcanic rock. From 154.4 m to 172.8 m, the drill hole intersected altered ultramafic rock. A 40 cm interval near the start of this altered ultramafic interval was mineralized with 5 to 10% pyrite and returned an occurrence-grade gold assay.	2.74 g/t Au over 0.4 m Albitization, Carbonatization, Silicification Pyrite
MDI42A05SE00041 Hollinger DDH M-6 Occurrence 455380 E, 5356230 N, Nickel	Hollinger Consolidated Gold Mines Ltd. diamond drilled hole M-6 in 1963. The hole collared through 120.5 feet of overburden before cutting a fine-grained serpentinite. The hole continued in the serpentinite to a depth of 897.6 feet where the contact with red syenite porphyry was encountered. The hole finished in the syenite porphyry at a depth of 1087 feet.	0.11% Ni, 0.415% S and 0.32% Cr over 5.0 feet Pyrite
MDI42A05SW00002 Karvinen Occurrence 452023 E, 5352468 N Gold	A pink to orange, sericite and ankerite altered, quartz-feldspar porphyry hosts the Karvinen occurrence. Numerous white quartz veins and veinlets cut the porphyry. The wall rock to these veins contains disseminated pyrite (up to 2 %). The porphyry is massive to locally sheared, and intrudes highly altered ultramafic rocks.	0.14 ounce per ton gold for a grab sample Sericite, Ankerite, Magnesite, Fuchsite, Talc, Chlorite Pyrite
MDI42A05SE00034, McCoshen Occurrence Wakemac 448174 E, 5352687 N Gold	The McCoshen occurrence is contained within finely interlayered basalts and ultramafic rocks. A stripped area over 100 m in length and up to 30 m in width exposes a wide zone of intense shearing and carbonate alteration with many short, pytgmatic and boudinage quartz veins and sulphide horizons. The principal schistosity strikes 280°/50° to 280°/75° and a secondary fabric is noted at 252°/80°. There are many small-scale folds and many mircofaults The shearing has overprinted all primary textures in the basalt and ultramafic rock. The sulphide horizons may have been continuous interflow sediments prior to deformation, but now that relationship is uncertain. It is equally possible that the sulphide horizons are secondary veins. There are multiple sets of quartz veins that are white to grey to blue-grey, have a waxy appearance and are generally sulphide poor. Boudinage quartz veins are both small and large scale. Some large-scale boudinage quartz veins were subsequently deformed into open z-shaped folds. Gold is associated with sulphide concentrations, especially concentrations of arsenopyrite. Quartz veining is not necessarily associated with the gold.	Surface sampling - 6.93 g/t Au over 0.5 m. Diamond-drill intersection - 0.5 m @ 18 549 ppb Au, >1 % As Chlorite, Carbonate, Sericite, Silicification Arsenopyrite, Pyrite, Galena, Sphalerite
MDI42A05SE00062 Prospectors Alliance DDH PA97-2 Occurrence 452770 E, 5355540 N Gold, Copper	Diamond drill hole PA97-2 collared in an intermediate to felsic fragmental and/or tuff at 5.3 m. The hole passed into mafic to intermediate tuffs at 39 m and continued to a depth of 150 m. Several feldspar porphyry units ranging from several centimetres to several metres in length intrude the metavolcanic rocks. From 117 to 120 m, the hole cut disseminated fine to coarse pyrite, a few stringer pyrrhotite and minor chalcopyrite. Upon assay, this interval returned anomalous copper and gold values. The drill log indicates that this interval is chloritized.	1332 ppb Au and 1419 ppm Cu over 1.0 m Chloritization Pyrite, Pyrrhotite and Chalcopyrite

MDI Number **Deposit Name** **Deposit Status** **Alternate Name(s)** **UTM Easting, UTM Northing,** **Commodity(ies)**	**Description**	**Best Result** **Alteration Minerals/Assemblages** **Ore/Gangue Minerals**
MDI42A05SE00063 Prospectors Alliance DDH PA97-4 Occurrence 451950 E, 5356025 N Gold, Copper	Diamond-drill hole PA97-4 collared in a felsic intrusive at 8.5 m. The hole continued in the intrusive to a depth of 108 m intersecting a sulphidized shear zone from 28 m to 30.6 m. From 108 m to the end of the hole at 175.5 m, the hole cut intermediate to mafic volcanic rock intruded by narrow feldspar porphyry dikes. Stringers and patchy chalcopyrite and pyrite occur in and near narrow moderately sheared zones and with narrow quartz veins. Sampling of these sheared zones and quartz veins yielded anomalous to occurrence-grade gold and copper assays. However, no distinguishing features were noted in the drill log for the interval that yielded the best gold assay.	4019 ppb Au over 0.5 m Pyrite, Chalcopyrite
MDI42A05SE00064 Prospectors Alliance DDH PA97-5 Occurrence 451920 E, 5356090 N, Gold, Copper	Diamond-drill hole PA97-5 collared in granite at 8 m. The hole encountered silicified mafic volcanic rock from 87.7 m to 96.9 m, a felsic dike from 96.8 m to 98.6 m and then continued in mafic to intermediate volcanic rock to a final depth of 130.9 m. The drill log indicates a 10 cm interval of quartz with finely disseminated and stringer chalcopyrite at 103.1 m. A 0.7 m sample including this mineralized material returned occurrence-grade copper and gold assays.	17459 ppm Cu, 1340 ppb Au over 0.7 m Silicification, Chlorite Chalcopyrite, Pyrite, Pyrrhotite
MDI42A06SE00027 Dodds, T. Occurrence Godon Group 447740E, 5350130 N Gold	Burrows (1911), presents the earliest record of prospecting in this general location: a small-scale map of Denton Tp. showing mining claims to the south of Godin [*sic*] Lake. Harding and Berry (1938) wrote that Thomas Dodds had re-staked part of the Godin [*sic*] Lake group and that stripping and trenching had uncovered several small quartz-carbonate-pyrite veins in narrow, northeast-striking shear zones with in the greenstones. They reported the greenstones to strike N30°E and dip steeply to the northwest. Nelson Hogg, an Ontario Dept. of Mines Resident Geologist, visited the area in 1946 at the request of Mr. A. Phillips of Timmins who had several claims in the Gordon [*sic*] Lake are in southwest Denton Tp. Hogg mapped the workings and reported gold values up to "0.03 oz. in gold" could be obtained in most pits and trenches. The best assay that was reported by Hogg was "0.07 oz." over 14 inches that was from a bluish, silicified material carrying finely disseminated pyrite.	"0.07 oz." over 14 inches Silicification, Chlorite, Sericite, Carbonate Pyrite
MDI42A05SE00045 Hazelton Vein No. 1 Discretionary 451975 E, 5356675 N Gold	J.E. Hawley (1926) wrote "Vein No. 1, situated six chains west of Mahoney Lake on claim P. 8751, strikes approximately N20E and dips steeply east. No definite vein can be traced through this zone of schist, but small stringers of bluish quartz and rusty to reddish carbonate are abundant. Thin sections of specimens taken along a similar shear zone to the west show a complete gradation from altered massive biotite granite to sericite schist with eyes of blue quartz. The vein or shear zone has a length of 150 feet, pinching out to the north and south and extending a short distance into Carscallen, Claim P.10988. Diamond drilling under the outcrop of this vein for a distance of 300 feet at an angle of 57 degrees, is reported to have cut mineralized sections of quartz and tourmaline, which yielded some gold on assay. The width of the zone on the surface ranges from 1 to 5 feet." An undated, anonymous, map in assessment file T-10 indicates that several assays on this vein range from 0.02 over 11 inches to 0.52 over 12 inches. Unfortunately, it is not known if these values are in ounce gold per ton, pennyweights or dollar values.	Sericitization
MDI42A05SE00040, Jowsey Vein Discretionary 451630 E, 5356625 N Gold	Little is know about the Jowsey Vein. Discovered before 1946, on the Jowsey Denton Gold Mines property, this discretionary occurrence consists of a vein contained in a north-trending shear in quartz diorite. A 1 inch to 20 feet trench plan in Timmins assessment file T-10 indicates that the vein yielded gold values up to 0.08 (units unknown) gold in a chip sample.	
MDI42A05SE00009 Scott Discretionary 448208 E, 5351915 N Gold	Harding and Berry (1938) report on the Scott Group of claims and indicate that surface workings have exposed a number of small quartz veins in rusty-weathering carbonated lava. Map No. 47d locates the Scott Group of 5 claims immediately to the northeast of Godon Lake. There are no other reports of mineralization in the immediate vicinity.	

Keno Property, Kenogaming Township

ACCESS AND LOCATION

D. Morin, R. Denomee and G. Ross intermittently held groups of claims in the north-central part of Kenogaming Township west of Akweska Lake. The claims cover geology deemed favourable for both gold and nickel mineralization; low values of nickel have been reported in sampling and drilling in the area. Access to the area is by Hwy 101 east of the town of Foleyet to the Kenogaming logging road. The property is 9 km south of the highway intersection. At time of writing, the claims had lapsed and the property is open to staking.

Previous work has included a small diamond drill program by Little Long Lac Gold Mines on Crawford Creek in 1947. This drilling encountered sulphide-bearing chert iron formation, a variety of porphyry rocks, lamprophyre dikes and greenstone. Pyrite, pyrrhotite and sparse chalcopyrite were identified. Delmico Mines Limited completed magnetic and electromagnetic surveys in 1965 and Texasgulf Inc. drilled 3 holes totalling 326 feet. Stripping, trenching and prospecting was completed by D. Morin, R. Denomee and G. Ross, and Timmins Nickel Inc. completed geological mapping and diamond drilling that yielded low nickel value. Falconbridge Limited did additional ground geophysical surveys, soil and humus geochemical surveys between 1990 and 1992.

GEOLOGY

Kenogaming Township has been mapped at a scale of 1:31 680 (Milne 1966). The north part of the Swayze greenstone belt abuts the Kenogamissi batholith in the northeast and south part of the township such that the southern half and eastern third of the township is underlain by felsic intrusive rocks. The central and northwest parts of the township are underlain by mafic to felsic metavolcanic rocks that are intruded by irregular masses of mafic to ultramafic intrusive rocks. Interspersed with the metavolcanic rocks are chemical and clastic metasedimentary rocks of limited extent.

The main showing is located at UTM location 0429614NE, 5335885N (NAD 83, Zone 17). It consists of a stripped and trenched area that exposes massive, dark green peridotite with minor disseminated sulphides in proximity to a pyrrhotite-bearing chert horizon. Pyrrhotite and rare chalcopyrite are present in the peridotite. The chert horizon exhibits extensive folding and deformation (Figure 13). Foliation in the chert trends 098°/75° north. Northward, outcrops of peridotite become finer grained to aphanitic and black in colour with an increase in both magnetite content and the degree of serpentinization.

The Keno property is interesting due to its strategic setting of ultramafic intrusive rocks occurring at the contact between a thick sequence of mafic flows on the north and felsic to intermediate metavolcanic rocks on the south. The chert magnetite horizon at the contact between 2 major assemblage boundaries could provide a sulphur source to ultramafic magma, resulting in the deposition of nickel mineralization in the area.

Figure 13. Thinly interbedded fine-grained clastic and chemical metasediments from the Keno property, Kenogaming Township.

Southern Swayze Greenstone Belt

Examination of several past-producing gold mines in the southern Swayze greenstone belt included site visits to the Young Shannon Gold Mine in Chester Township and the Jerome Mine in Osway Township. The location and geological settings of the mines are presented in Figure 14. Descriptions and history of each of these deposits are summarized in Fumerton and Houle (1995). The Young Shannon Mine consists of gold-bearing veins hosted by mafic intrusive rocks typical of a number of the gold deposits of the Swayze greenstone belt. In contrast, the Jerome Mine is hosted by Timiskaming-like clastic metasedimentary rocks (Figure 15), intruded by quartz feldspar porphyries with intense hematite and iron carbonate alteration. Gold occurs associated with molybdenite mineralization and, in this aspect, the Jerome Mine is atypical for Archean gold deposits. The host rocks to gold mineralization can be traced northwest to Swayze Township where very large syenite boulder clasts in conglomerate suggest a proximal source of the sediment.

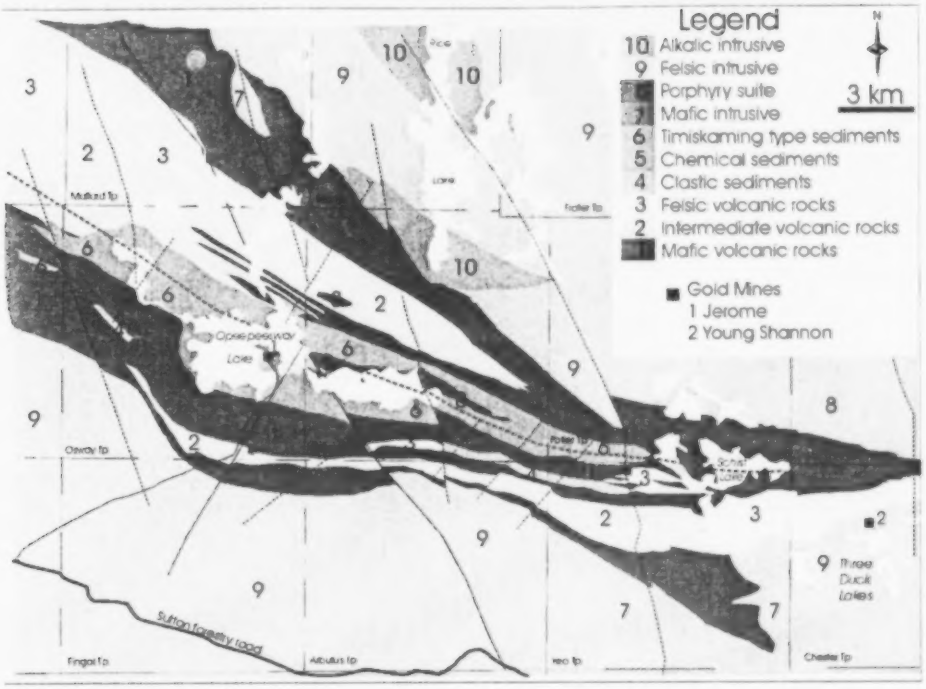


Figure 14. Geology of the southern Swayze greenstone belt in the vicinity of the Young Shannon and Jerome gold mines.

Figure 15. Outcrop of Timiskaming-like, heterolithic, clast-supported conglomerate. Clast types include felsic intrusive rock, mafic to felsic volcanic rocks and ironstone at the Jerome Mine, Osway Township.

RECOMMENDATIONS FOR EXPLORATION

Gold in the Southern Swayze Greenstone Belt

Westward from the Jerome Mine, clast-supported boulder conglomerate with syenite clasts are reminescent of alkalic associated gold deposits at Kirkland Lake. There, major gold deposits are concentrated along very narrow "breaks" that pass through both conglomeratic sediments and syenite intrusions. In the south Swayze area, discovery of restricted breaks within broader bands of geochemically altered host rocks might yield large quantities of gold similar to the Kirkland Lake mines.

Diamonds

Luhta et al. (1993) reported the presence of a pebble dike of either lamproite or kimberlite composition on the 525 m level of the Detour Lake Mine. The area has not traditionally received exploration attention for diamond-bearing kimberlite, but the report of possible kimberlite suggests the area warrants consideration.

The distribution of known diamond occurrences in the Wawa area is presented in Figures 16 and 17. These figures are keyed to Table 15. Known diamond and kimberlite occurrences throughout the district are tabulated in Table 16.

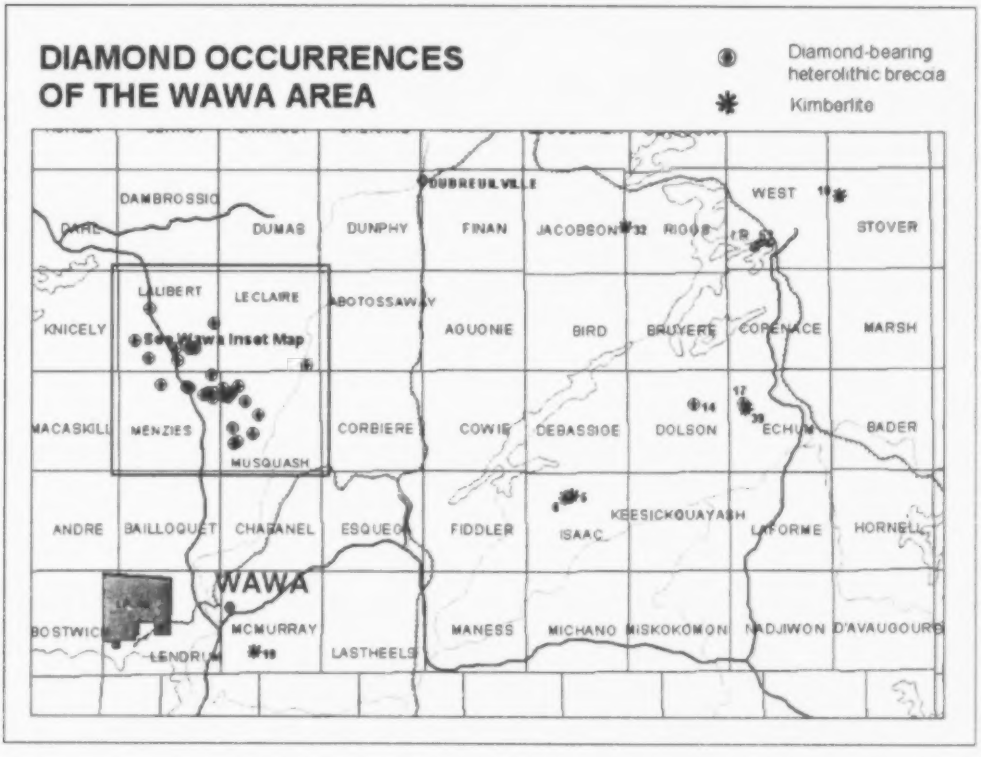


Figure 16. Diamond occurrences in the Wawa area. See Figure 17 for detail of inset map. Locations keyed to Table 15.

Figure 14. Geology of the southern Swayze greenstone belt in the vicinity of the Young Shannon and Jerome gold mines.

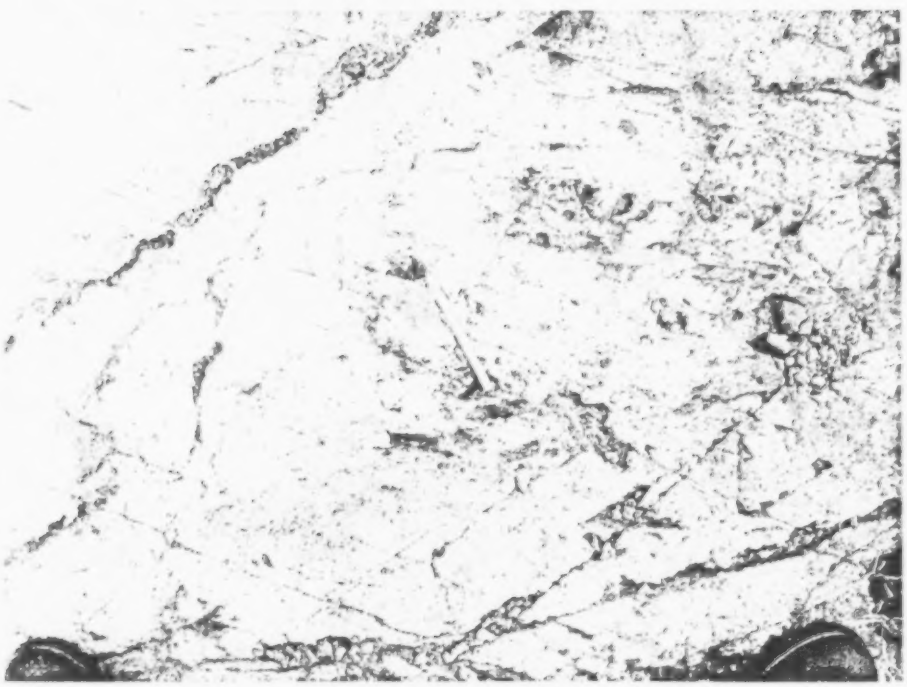


Figure 15. Outcrop of Timiskaming-like, heterolithic, clast-supported conglomerate. Clast types include felsic intrusive rock, mafic to felsic volcanic rocks and ironstone at the Jerome Mine, Osway Township.

RECOMMENDATIONS FOR EXPLORATION

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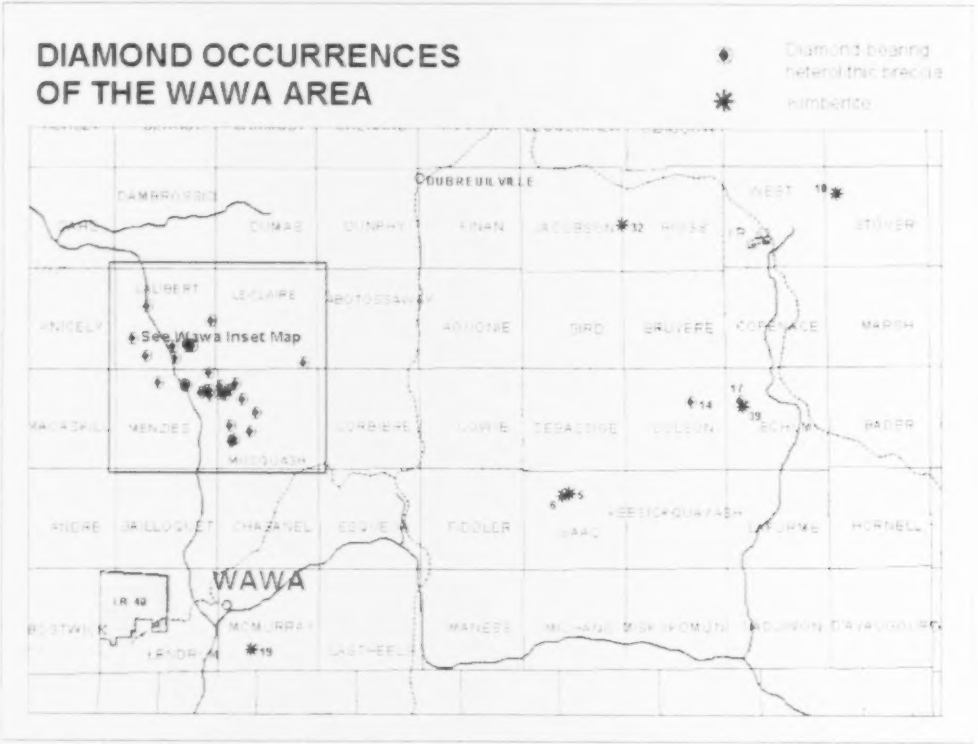

Figure 16. Diamond occurrences in the Wawa area. See Figure 17 for detail of inset map. Locations keyed to Table 15.

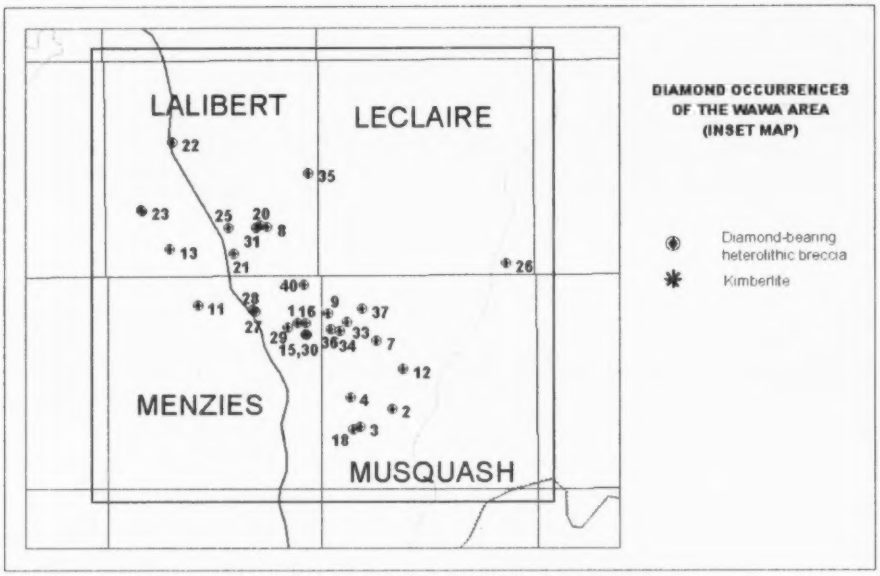

Figure 17. Diamond occurences and kimberlite in Lalibert, Leclaire, Menzies and Musquash townships. Locations keyed to Table 15.

Table 15. Confirmed diamond and kimberlite occurrences in the Wawa area. Locations keyed to Figures 16 and 17.

Confirmed Diamond and Kimberlite Occurrences in the Wawa Area			
Map No.	**Name**	**Property Ownership**	**Rock Type**
1	B-1 Occurrence	Pele Mountain Resources Inc	heterolithic breccia
2	Band-Ore Area D	Band-Ore Resources Ltd.	heterolithic breccia
3	Band-Ore East Occurrence	Band-Ore Resources Ltd.	heterolithic breccia
4	Barnett Lake Zone	Band-Ore Resources Ltd.	heterolithic breccia
5	Canabrava Intrusion 115	Canabrava Diamond Corporation	kimberlite
6	Canabrava Intrusion 121	Canabrava Diamond Corporation	kimberlite
7	Cristal Occurrence	Pele Mountain Resources Inc	heterolithic breccia
8	Destiny Showing	Pele Mountain Resources Inc	heterolithic breccia
9	Dom Perignon Occurrence	Pele Mountain Resources Inc	heterolithic breccia
10	Dome DDH-83-2		kimberlite
11	Dumont Sample 4073	Dumont Nickel Inc.	heterolithic breccia
12	Engagement Zone	Band-Ore Resources Ltd. /Kennecott Canada Exploration Ltd.	heterolithic breccia
13	Enigma Property	Oasis Diamond Exploration Inc. /Arctic Star Diamond Corp.	metamorphosed kimberlite(?)
14	Fletch Occurrence	Geodex Minerals Ltd.	kimberlite (diamondiferous)
15	Genesis	Pele Mountain Resources Inc	heterolithic breccia
16	Genesis West	Pele Mountain Resources Inc	heterolithic breccia
17	Geodex No. 2 Dike	Geodex Minerals Ltd.	kimberlite (diamondiferous)
18	GQ Diamond Occurrence	Band-Ore Resources Ltd.	heterolithic breccia
19	Grace Kimberlite Dike	Citadel Gold Mines Inc./Tri Origin Exploration Ltd.	kimberlite
20	Krug Occurrence	Pele Mountain Resources Inc	heterolithic breccia
21	LAL-103 Occurrence	Spider Resources Inc./KWG Resources Inc. /Diagem International Resource Corp.	heterolithic breccia

Confirmed Diamond and Kimberlite Occurrences in the Wawa Area

Map No.	Name	Property Ownership	Rock Type
22	LAL-126 Occurrence	Spider Resources Inc./ KWG Resources Inc. /Diagem International Resource Corp.	hypabyssal facies
23	LAL-161 Occurrence	Spider Resources Inc./KWG Resources Inc. /Diagem International Resource Corp.	hypabyssal facies
24	LAL-163 Occurrence	Spider Resources Inc./KWG Resources Inc. /Diagem International Resource Corp.	hypabyssal facies
25	LAL-3 Occurrence	Spider Resources Inc./KWG Resources Inc. /Diagem International Resource Corp.	hypabyssal facies
26	Magpie Diamond Occurrence	Oasis Diamond Exploration Inc. /Dia Bras Exploration Inc.	alkaline breccia
27	MEN -106	Spider Resources Inc./ KWG Resources Inc. /Diagem International Resource Corp.	heterolithic breccia
28	MEN-107	Spider Resources Inc./KWG Resources Inc. /Diagem International Resource Corp.	hypabyssal facies and heterolithic breccia
29	Moet Occurrence	Pele Mountain Resources Inc	heterolithic breccia
30	Mumm	Pele Mountain Resources Inc	heterolithic breccia
31	P. C. Showing	Pele Mountain Resources Inc	heterolithic breccia
32	Pele DDH 97-34	Pele Mountain Resources Inc	kimberlite
33	Perch East Occurrence	Pele Mountain Resources Inc	heterolithic breccia
34	Perch West Occurrence	Pele Mountain Resources Inc	heterolithic breccia
35	Pol Roger Occurrence	Pele Mountain Resources Inc	heterolithic breccia
36	Pommery	Pele Mountain Resources Inc	heterolithic breccia
37	Salon Occurrence	Pele Mountain Resources Inc	heterolithic breccia
38	Sandor Occurrence	Spider Resources Inc./KWG Resources Inc. /Diagem International Resource Corp.	diamond-bearing spessartite
39	Tremblay Sample AA-1	Geodex Minerals Ltd.	kimberlite
40	Veuve Cliquot	Pele Mountain Resources Inc	heterolithic breccia

Table 16. Known diamond and kimberlite occurrences of the Timmins District with UTM co-ordinates (NAD 27, Zones 16 and 17).

Name	Township/Area	UTM North	UTM East	Commodities
India-1	BMA 526 834	5836451.000	310255.000	Kimberlite
X-Ray-1	BMA 526 834	5841800.000	314350.000	Kimberlite
Zulu-1	BMA 526 834	5845800.000	308750.000	Diamond, Kimberlite
Alpha-1 North	BMA 526 834	5842125.000	312585.000	Diamond, Kimberlite
Alpha-1	BMA 526 834	5841470.000	312385.000	Diamond, Kimberlite
Delta 1	BMA 527 833	5852560.000	320540.000	Diamond, Kimberlite
Delta North	BMA 527 833	5852700.000	321575.000	Kimberlite
Tango-1	BMA 527 834	5861750.000	300350.000	Kimberlite
MacFadyen 1	BMA 527 834	5862814.000	301494.000	Diamond, Kimberlite
MacFadyen 2	BMA 527 834	5862572.000	301755.000	Diamond, Kimberlite
Bravo-1	BMA 527 834	5856900.000	305300.000	Diamond, Kimberlite
Charlie-1	BMA 527 834	5860600.000	302700.000	Kimberlite
Tango Extension	BMA 527 834	5861500.000	300900.000	Diamond, Kimberlite
Victor Kimberlite	BMA 527 834	5856250.000	305600.000	Diamond, Kimberlite
Whiskey-1	BMA 527 834	5854615.000	306943.000	Diamond, Kimberlite
X-Ray	BMA 527 834	5853200.000	307700.000	Diamond, Kimberlite
Yankee-1	BMA 527 834	5851065.000	306210.000	Kimberlite
AT-56 Kimberlite	BMA 527 834	5853377.000	308648.000	Diamond, Kimberlite
Gulf-1	BMA 528 834	5867450.000	310480.000	Kimberlite
Uniform-1	BMA 528 834	5862250.000	304900.000	Kimberlite
Kyle Lake No.1		5813250.000	608700.000	Diamond, Kimberlite

Name	Township/Area	UTM North	UTM East	Commodities
Kyle No.4		5858550.000	615450.000	Kimberlite
Kyle No.2		5893150.000	602950.000	Diamond, Kimberlite
Kyle Lake No.5		5881700.000	601660.000	Kimberlite
Kyle No.3		5894450.000	580600.000	Diamond, Kimberlite
Fletch Occurrence	Dolson	5338053.000	709103.000	Diamond, Kimberlite
Tremblay Sample AA-1	Dolson	5337825.000	714150.000	Kimberlite
Geodex No.2 Dike	Dolson	5338530.000	713850.000	Diamond, Kimberlite
Lignasco Hole 42I4-200-1	Emerson	5561650.000	429850.000	Kimberlite
Ranoke 74-5	Hogg	5587269.360	446204.317	Kimberlite
Canabrava Intrusion 115	Isaac	5329022.000	697841.000	Kimberlite
Canabrava Intrusion 121	Isaac	5328800.000	697140.000	Kimberlite
Keith Dike	Keith	5332150.000	407600.000	Kimberlite, Nickel
LAL-3 Occurrence	Lalibert	5341968.000	659805.000	Diamond
LAL-103 Occurrence	Lalibert	5340841.000	660060.000	Diamond
LAL-126 Occurrence	Lalibert	5345744.000	657193.000	Diamond
LAL-161 Occurrence	Lalibert	5342652.000	655906.000	Diamond
LAL-163 Occurrence	Lalibert	5342648.000	655914.000	Diamond
Destiny Showing	Lalibert	5342050.000	661540.000	Diamond
Sandor Occurrence	Lalibert	5341968.000	659805.000	Diamond
P.C. Showing	Lalibert	5342020.000	661050.000	Diamond
Krug Occurrence	Lalibert	5342125.000	661210.000	Diamond
Pol Roger Occurrence	Lalibert	5344500.000	663290.000	Diamond
Enigma Property	Lalibert	5340948.000	655983.000	Diamond
Magpie Diamond Property	Leclaire	5340690.000	672230.000	Diamond
Hill DDH 96-1	Mann	5411560.000	494790.000	Diamond, Nickel, Palladium
Grace Kimberlite Dike	McMurray	5313204.000	668054.000	Kimberlite
Men-106	Menzies	5338256.000	661108.000	Diamond
Men-107	Menzies	5338348.000	660971.000	Diamond
Dumont Sample 4073	Menzies	5338480.000	658530.000	Diamond
B-1 Occurrence	Menzies	5337790.000	662980.000	Diamond
Moet Occurrence	Menzies	5337590.000	662560.000	Diamond
Veuve Cliquot	Menzies	5339510.000	663225.000	Diamond
Mumm	Menzies	5337270.000	663380.000	Diamond
Genesis	Menzies	5337275.000	663410.000	Diamond
Genesis West	Menzies	5337810.000	663350.000	Diamond
Barnett Lake Zone	Musquash	5334525.000	665425.000	Diamond
Band-Ore Area D	Musquash	5334050.000	667310.000	Diamond
Band-Ore East Occurrence	Musquash	5333200.000	665880.000	Diamond
GQ Diamond Occurrence	Musquash	5333068.000	665570.000	Diamond
Cristal Occurrence	Musquash	5337075.000	666525.000	Diamond
Perch West Occurrence	Musquash	5337480.000	664875.000	Diamond
Perch East Occurrence	Musquash	5337900.000	665175.000	Diamond
Dom Perignon Occurrence	Musquash	5338250.000	664350.000	Diamond
Salon Occurrence	Musquash	5338510.000	665825.000	Diamond
Engagement Zone	Musquash	5335850.000	667760.000	Diamond
Pommery	Musquash	5337550.000	664470.000	Diamond
Clement Diamond Discovery	Rabazo	5310790.000	663050.000	Diamond
Pele DDH 97-34	Riggs	5354850.000	702175.000	Kimberlite
Lignasco Hole J-8-101	Sanborn	5567925.000	419725.000	Kimberlite
Jarvi Diamond	Sheraton	5360575.000	515075.000	Diamond
Dome DDH 83-2	Stover	5358440.000	277880.000	Kimberlite

OGS ACTIVITIES AND RESEARCH BY OTHERS

A number of mapping and research projects were underway or completed in the Timmins District Details of the projects are reported in *Summary of Field Work and Other Activities 2001* (Baker et al. 2001) and in *Summary of Field Work and Other Activities 2002* (Baker et al. 2002).

Other projects currently underway in the Timmins District are

- L.A.F. Hall, Precambrian Section, Ontario Geological Survey, completed geological mapping of Deloro Township at a scale of 1:20 000.
- M. DeWolfe, Laurentian University, Sudbury, continued MSc research on the stratigraphic and structural setting of the north rhyolite at the Kidd Creek Mine in Kidd Township.
- T.M. Desjardins, Laurentian University, Sudbury, began work on an MSc thesis in which she is investigating the process of greenstone belt development. Recently compiled evidence on the development of greenstone belts suggest either autochthonous or parautochthonous origin. Investigation of the boundary relationships between volcanic cycles in the Michipicoten greenstone belt, through the use of geochemical, petrographic and structural investigations, will allow testing of these models. The Wawa area was chosen because of the exceptional outcrop exposure and the abundance of previous mapping combined with the availability of appropriate geochronological work.
- N. Lefebvre, University of British Columbia, Vancouver, commenced work on an investigation of the diamond occurrences in the alkaline metavolcanic rocks in the Wawa area. In particular, she is investigating a suite of diamonds recovered from a series of diamond occurrences on the GQ Property, held jointly by Band-Ore Resources Ltd. and Kennecott Canada Exploration Inc. The results of the thesis will provide insight into petrology of the deep mantle at depths greater than 200 km below the Superior Craton.
- E. Dinel, University of Ottawa, continued MSc research on gold mineralization in Timmins.
- S. Préfontaine, University of Ottawa, did BSc research and geological mapping at Serpentine Mountain, McArthur Township.

Operation Treasure Hunt

Operation Treasure Hunt supported kimberlite indicator mineral sampling surveys in the James Bay Lowland. A total of 1185 heavy mineral samples were collected throughout much of the Attawapiskat and Albany River drainage basins where these are underlain by Phanerozoic rocks of the James Bay and Hudson Bay lowlands. This work was contracted out to members of the First Nations communities of Attawapiskat, Fort Albany and Kashechewan. Sample analysis included identification of kimberlite indicator minerals, as well as precious metals and base metal indicator minerals.

ACKNOWLEDGMENTS

Information on past activities reported in the text are from assessment files and other files of the Timmins Resident Geologist Office unless otherwise noted. Information on current mining and exploration activities has been provided by Prospectors and company personnel, and compiled from assessment files and public information sources.

Table 17. Assessment files received for the Timmins District in 2002.

Abbreviations

AEM ..... Airborne electromagnetic survey
AM ..... Airborne magnetic survey
AVLF.... Airborne very low frequency electromagnetic survey
Beep..... Beep Mat survey
Bl..... Blasting
Bulk ..... Bulk sampling
Comp ..... Compilation
DD ..... Diamond drilling
DGP..... Down-hole geophysics
GC ..... Geochemical survey
GL ..... Geological survey
GM ..... Ground magnetic survey
GT ..... Geotechnical survey
HLEM..... Horizontal loop electromagnetic survey
HM ..... Heavy mineral sampling
IM..... Industrial mineral testing and marketing
IP..... Induced polarization survey
Lc ..... Linecutting
NOHFC ..... Northern Ontario Heritage Fund Corporation
OD ..... Overburden drilling
OP ..... Ontario Prospectors Assistance Program
PEM ..... Pulse electromagnetic survey
Pr..... Prospecting
Samp..... Sampling (other than bulk)
Str..... Stripping
TEM ..... Transient electromagnetic survey
Tr..... Trenching
VLFEM ..... Very low frequency electromagnetic survey

Township Area	Company Name	Year	Work Type	AFRO No.	T-File No.
Rabazo	Bridget Lake Resources Incorporated	2001	DD - 2 - 295m	2.22642	WP Rabazo - 39
Bristol	Cameco Corporation	2000	Assays, DD - 3 - 741m	2.22349	T-4649
Whitney	Kinross Gold Corporation	2001	Assays, DD - 2 - 2612ft	2.22511	T-4650
Chester	Emerald Isle Resources Inc.	2001	Assays, Str	2.22604	T-4651
Wark	Pegg, C.C.	2001	Assays, Samp	2.22563	T-4652
Desrosiers	Gagne, M.Y.	1999-2001	Assays, Pr, Tr	2.22086	T-4653
McCoig	East West Resource Corporation	2001	Assays, DD - 4 - 641m	2.22605	T-4654
Reid	Meunier, D.	2000	HLEM, Lc	2.22434	T-4655
Avon	Hinterland Exploration Ltd.	2001	GM, IP, Lc	2.22495	T-4656
BMA 527 834	De Beers Canada Exploration Inc.	2001	Bulk, HM	2.22622	T-4648
McCoig	East West Resource Corporation	2001	GM, HLEM, IP, Lc	2.22576	T-4657
BMA 525 834, BMA 526 834, BMA 527 833, BMA 527 834, BMA 528 834, BMA 528 841, BMA 531 841, BMA 531 842	Canabrava Diamond Corporation	2001	DD - 12 - 1018m, GM, Lc	2.22569	T-4658
McMurray, Naveau	Algoma Ore Properties, Limited	1922	Comp	donation	WP McMurray - 81
Mallard	Anderson, S.D.	2001	Assays, Str	2.22667	T-4659
Ireland	Northern Shield Resources Inc.	2001	DD - 1 - 72m	2.22186	T-4660
Aguonie	Algoma Central Railway	1918	Comp	donation	WP Aguonie - 10
Riggs	Patricia Mining Corp.	2001	Assays, DD - 1 - 50m	2.22243	WP Riggs - 61
Chabanel	The Algoma Steel Corporation, Limited	1902-1916	GL	donation	WP Chabanel - 51
Shaw	Cole, B.L.	2001	GM, VLFEM	2.22471	T-4662
BMA 526 834	De Beers Canada Exploration Inc.	2001	Bulk, HM	2.22711	T-4664
BMA 528 834	De Beers Canada Exploration Inc.	2001	Bulk, HM	2.22713	T-4665
Chester	Blanchard, E.J.	2001	Assays, Str	2.22237	T-4661
BMA 527 833	De Beers Canada Exploration Inc.	2001	Bulk, HM	2.22710	T-4663
Cowie	Algoma Central Railway	1911-1944	Comp, GL	donation	WP Cowie - 7
Godfrey	Falconbridge Limited	2001	Assays, GL, Pr, Samp	2.22330	T-4666
Camp Lake	Algoma Central Railway	1913	GL	donation	WP Camp Lake - 9
Prosser, Wark	Pegg, C.C.	2001	Samp, VLFEM	2.22553	T-4667
Abotossaway, Bailloquet, Chabanel, Corbiere, Esquega, Leclaire	The Lake Superior Corporation	1911-1912	Assays, Comp, GL	donation	WP Abotossaway - 34

Township Area	Company Name	Year	Work Type	AFRO No.	T-File No.
Riggs	Pele Mountain Resources Inc.	1999-2000	Bulk	2.22379	WP Riggs - 62
Jacobson	Pele Mountain Resources Inc.	1999-2000	Assays, Bulk, Str	2.22230	WP Jacobson - 74
Moberly, Thorburn	Lalonde, D.J.	2001	Assays, DD - 1 - 149m, HLEM	2.22826	T-4672
Pinard	Inco Limited	2001	AEM, AM	2.22575	T-4671
Halliday	Pegg, C.C.	2001	Assays, DD - 1 - 250m	2.22796	T-4670
Denton	1232448 Ontario Inc.	1997	Assays, DD - 5 - 808m	2.22398	T-4669
Loveland	Meunier, D.	2002	DD - 1 - 36m	2.22778	T-4668
Riggs	Archibald, J.C.	2001	Assays, DD - 1 - 100m	2.22851	WP Riggs - 63
Clergue, Stock	Hornby Bay Exploration Limited	2002	GM, Lc, VLFEM	2.22963	T-4673
Clergue	Falconbridge Limited	2001	GM, HLEM, Lc	2.22997	T-4674
McMurray	Gold Insight Resources Ltd.	2001	Assays, GC, OD - 15 - 181ft	2.22043	WP McMurray - 82
Turnbull	Anderson, S.D.	2001	Assays, Pr, Samp	2.22406	T-4676
Chester	Ferguson, H.S.	1999-2000	Assays, DD - 3 - 677m, GL, GM, Lc, Samp, Str	2.22411	T-4675
Bradburn, Calder	Falconbridge Limited	2001	Pr	2.23050	T-4682
Zavitz	Claim Lake Resources Inc.	1999	IP	2.23036	T-4677
Dundonald	Falconbridge Limited	2001	Pr	2.23038	T-4678
Bradburn	Falconbridge Limited	2001	Pr	2.23042	T-4679
Bradburn	Falconbridge Limited	2001	Pr	2.23049	T-4681
Tully	Kinross Gold Corporation	2000-2001	Assays, DD - 1 - 201m, GM, HLEM, Lc	2.23130	T-4683
Corbiere	Band-Ore Resources Ltd.	2001	Assays, Pr	2.23114	WP Corbiere - 20
Bradburn	Falconbridge Limited	2001	Pr	2.23039	T-4680
Dahl, Killins, Knicely	The Algoma Steel Corporation, Limited	1954-1973	AM, DD - 1 - 910ft, GL, GM, Samp	donation	WP Dahl - 1
Abbie Lake, Keating Additional	Gerdes, J.A.	2000-2001	Str	2.22378	WP Abbie Lake - 23
Finan	Algoma Ore Properties, Limited	1958-1959	GEM, GM	donation	WP Finan - 70
BMA 526 834	De Beers Canada Exploration Inc.	2001	AEM, AM	2.22933	T-4685
Heenan	MacDonnell, A.	2001-2002	GL, Tr	2.22875	T-4684
BMA 528 834	De Beers Canada Exploration Inc.	2001	AEM, AM	2.22936	T-4686
Lizar, Nameigos	Freewest Resources Canada Inc.	2001	HLEM, IP	2.22944	WT Lizar - 22
Breckenridge, Lizar, Mosambik, Nameigos	Freewest Resources Canada Inc.	2001	GM, Lc	2.22943	WP Breckenridge - 1
Macdiarmid, Mahaffy, Reid	Falconbridge Limited	2001	Assays, DD - 3 - 740m	2.23054	T-4688
Staples	Berland Resources Ltd.	2001-2002	DD - 1 - 32m, GM	2.23088	T-4687
Abotossaway	West Goudreau Development Syndicate	1922-1965	Comp	donation	WP Abotossaway - 35
Mishibishu Lake	Palahnuk, B.E.	2001	Pr	2.23126	WP Mishibishu Lake - 63
Dolson, Echum	Tremblay, M.A.	2000-2002	Assays, HM, Pr, Str	2.23134	WP Dolson - 4
Rennie	Falconbridge Limited	2000	Assays, DD - 2 - 295m	2.23245	WP Rennie - 16
Halliday	Pegg, C.C.	2001	Assays, GL, Pr, Samp	2.23403	T-4690
Hutt	Falconbridge Limited	2000-2001	Assays, DD - 1 - 166m, DGP	2.23526	T-4689
Dundonald	Salo, L.J.	2002	Lc	2.23415	T-4694
Brower	Haire, P.G.	2001-2002	GC, Lc, Samp	2.23382	T-4691
Loveland	Meunier, D.	2002	Assays, Samp	2.23535	T-4695
Clergue, Dundonald	Falconbridge Limited	2001	Pr	2.23497	T-4692

Township Area	Company Name	Year	Work Type	AFRO No.	T-File No.
Crockett	Robert the Bruce Distilleries Ltd.	2002	GM, Lc	2.23527	T-4693
McMurray	Artisan Gold Inc.	2001-2002	Pr, Samp	2.23494	WP McMurray - 83
Dunphy, Finan, Jacobson, Riggs	Patricia Mining Corp.	2001	Assays, GC, GL, HM, Pr, Samp	2.23285	WP Finan - 71
Dundonald	Falconbridge Limited	2001	Assays, DD - 14 - 2043m	2.23408	T-4697
Farquhar	Fournier, E.	2000	Assays, DD - 5 - 1381ft	2.23489	T-4696
Rennie	Falconbridge Limited	2000	Assays, DD - 1 - 260m	2.23237	WP Rennie - 17
Dolson	Algoma Central Railway	1953	Pr	donation	WP Dolson - 5
Bristol	Gervais, L.N.	2002	GM, HLEM, Lc	2.23528	T-4699
Deloro	Ontex Resources Limited	2002	GM, Lc, VLFEM	2.23571	T-4698
Murphy	Moneta Porcupine Mines Inc.	2001-2002	Assays, DD - 4 - 952m, DGP, GM, HLEM, Lc, TEM	2.23570	T-4700
Keating, Keating Additional	The Algoma Steel Corporation, Limited	1943-1964	Assays, GL, GM, Pr	donation	WP Keating - 3
Sutcliffe, Valentine, Wright	The Algoma Steel Corporation, Limited	1967-1982	Bulk, Comp, IM	donation	T-4701
Acres, Amery, Canfield, De Pencier, Dyer, Emerson, Garden, Gardiner, Gentles, Habel, Hambly, Hamlet, Heela, Hobson, Hogg, Kilmer, Kipling, Lambert, Mahoney, McBrien, McCausland, McCuaig, Morrow, Mulholland, Ophir, Pickett, Rapley, Sanborn, Stapells	The Algoma Steel Corporation, Limited	1967-1982	Bulk, Comp, IM	donation	T-4701
Chabanel	The Algoma Steel Corporation, Limited	1981-1982	Comp	donation	WP Chabanel - 52
Denton, Keefer	Galata, F.	1997	Pr	2.23803	T-4702
Keefer	Galata, F.	2000	Str, Tr	2.23722	T-4703
Clergue	Pentland Firth Ventures Ltd.	1996-1999	Assays, DD - 8 - 1644m, GC, GL, Samp	donation	T-4704
Ebbs, Scholfield	DIOS Exploration Inc.	2001	SA, HM, KIM, Assays, OVD-12-147.3m	2.23563	T-4705
Hellyer	Canabrava Diamond Corporation	2001-2002	PR, Samp, AM	2.23169	T-4706
Penhorwood	Leo Alaric and Sons Limited	2001	Pr, Str, GL, SA, GM, Tr	2.23325	T-4707
Brower	Haire, P.G.	2002	Pr, GM, EM	2.23830	T-4710
Halcrow, Tooms	Patric, D.	2000	LC, IP	2.23521	T-4709
Valentine, Pitt, Kilmer, Hamlet	McKinnon, D.	2002	GL, LC, GM	2.23605	T-4708
McMurray	Artisan Gold Mines Incorporated	2001-2002	Other	2.23512	WP McMurray-84
Jacobson	Vencan Gold Corporation	2002	Lc, GL, Assays	2.23348	WP Jacobson-75
Bailloquet, Chabanel	Gold Insight Resources Ltd.	2002	SA, GM, HM, Assays	2.23044	WP Bailloquet-10
Hamlet, Emerson	Big Red Diamond Co.	2002	GM, HM	2.23183	T-4711
Keefer, Denton	Galata, F.	2000	HLEM, Lc	2.23861	T-4712
Staples, Casselman	Canabrava Diamond Corporation	2001-2002	SA, HM, GM	2.23383	T-4713
Lizar & Breckenridge	Freewest Resources Canada Inc.	2002	Pr, GM Max Min, IPEM, surveys, Tr, Str, Samp, trench mapping, assays, Assays	2.23604	WT Lizar-23
Chester	Gervais, L.N.	2002	Physical Work, Assays	2.23733	T-4719
Whitney	Liberty Mineral Exploration Inc.	2002	IP	2.23732	T-4720
Casselman	Hinzer, J.	2002	AM	2.23763	T-4718
Zavita, Hutt	Claim Lake Resources Inc.	2002	Lc, GL, Mad/VLFEM	2.23958	T-4715
Mann, Duff	First Point Minerals Corporation	2001	GM	2.24019	T-4721

Township Area	Company Name	Year	Work Type	AFRO No.	T-File No.
Reid	Falconbridge Limited	2002	DD-1-207m	2.23997	T-4717
Langmuir	Starfire Minerals Inc.	2002	GM, HLEM	2.23819	T-4716
BMA 527 834 Area	Navigator Exploration Corp.	2001-2002	Beneficiation	2.23906	T-4725
Lowther	Lecours Exploration Inc.	2001	Tr, Str, Assays	2.23480	T-4724
Avon	Pegg, C.C.	2002	DD-1-215m, Assays	2.23487	T-4726
Shaw	Nortem Mining & Exploration Inc.	2000	DD-14-320m	2.23206	T-4722
Upper Kesagami Lake, Little Kesagami Lake	Eastmain Resources Inc.	2001-2002	DD-8-1335m, Assays	2.23601	T-4727
Mann, Duff	Tres-Or Resources Ltd.	2001	Lc, GM, IP Surveys	2.23922	T-4723
Hawkins	McKinnon, D.	2002	Str	2.23680	WT Hawkins-32
Langmuir	Sea Emerald Development Corporation	2001	Augerholes- 7-20m (tailings), Assays	2.23736	T-4732
Loveland	Meunier, D.	2002	Str	2.23706	T-4731
Slack	Arsenault, J.P.	2001	Trench clearing	2.23550	T-4730
BMA 527 834 Area	Spider Resources Inc.	2001	GM Interp	2.24050	T-4729
Loveland	Meunier, D.	2002	DD-1-141m (EXTN)	2.23965	T-4728
Chester	Gervais, L.N.	2002	Str, SA, Assays	2.23734	T-4733
Langmuir	Liberty Mineral Exploration Inc.	2002	Lc, mag	2.23649	T-4734
Reid	Falconbridge Limited	1998-1999	Geophysical Work, HLEM, Mag Surveys	2.23768	T-4735
Hoyle	Salo, A.J.	2002	Line Recut, Comp. Rept.	2.24088	T-4737
Eldorado	Starfire Minerals Inc.	2002	Lc, GM, HLEM	2.24090	T-4736
Sewell	Ross, F.J.	2001-2002	Pr, Str, SA, Assays	2.23712	T-4738
German	Moneta Porcupine Mines Inc.	2002	DD-1-506ft	2.23955	T-4740
Penhorwood	La société de gestion Maskours inc.	2001	Str, Bulk Sa, GL	2.23516	T-4739
Carter	Jerome, A.	2002	Pr, Samp, Assays	2.24204	T-4741
Bristol	Cameco Gold Inc.	2001	DD-3-1483m, Assays	2.24251	T-4742
BMA 524 832	Goldaur Resources Inc.	2002	AM	2.23898	T-4743
Hoyle	Salo, A.J.	2002	Pros. Data Comp.	2.24148	T-4744
Cody and Macklem	Kinross Gold Corporation	2002	IP, GM	2.24232	T-4745
Hoyle	Salo, A.J.	2002	Pros.	2.24253	T-4746
Hoyle	Salo, A.J.	2002	Re-Cutting Line	2.24124	T-4749
Hoyle	Salo, A.J.	2002	GL	2.24147	T-4748
Fox River Area	Diatreme Explorations Inc.	2001-2002	GM, Air Photo Study	2.24145	T-4747
Sewell	Ross, F.J.	2002	Assays, Samp	2.23792	T-4750
Macklem	Kinross Gold Corporation	2002	DD-59-33,521.20 feet	2.24187	T-4751
Pinard	Opawica Explorations Inc.	2001-2002	Lc, AM, AEM, EM	2.23600	T-4752
BMA 527 834 Area	De Beers Canada Exploration Inc.	2001-2002	AM, EM, DD-21-449m	2.23991	T-4753
Tooms	Canabrava Diamond Corporation	2001-2002	Pros, Samp, Airborne GP, DD-1-210m	2.23520	T-4754
Ogden	L.B.L. Richgold Mines Incorporated	2001	Pros.	2.23683	T-4755
Finan	Golden Goose Resources Inc.	2002	DD-17-8999 feet	2.24103	WP Finan-72
Loveland	Meunier, D.	2002	Str	2.24351	T-4756
Matheson	Placer Dome (CLA) Limited	2002	Grav.	2.24300	T-4757
Jacobson	Pick Mines Ltd..			donation	WP Jacobson-76
Reid	Falconbridge Limited	2002	DD-3-635.03 feet	2.24384	T-4759

Township Area	Company Name	Year	Work Type	AFRO No.	T-File No.
Casselman, Swanson	Hinzer, J.	2001-2002	Samp, Auger test holes (9), Mag survey	2.24386	T-4758
Chester	Young-Shannon Gold Mines, Limited	2002	DD-2-1150 feet	2.24387	T-4760
Evelyn	Salo, A.J.	2001	DD-1-307.1 feet	2.23972	T-4764
Clergue	Liberty Mineral Exploration Inc.	2002	Mag Survey	2.24466	T-4767
Cody	Moneta Porcupine Mines Inc.	2002	DD-2-168.7 m	2.24408	T-4765
Denton	Explorers Alliance Corporation	2002	DD-1-72 m	2.24494	T-4766
Alarie	Algoma Ore Properties, Limited	1959-60	Property description	donation	WP Alarie-02
BMA 527 834 Area	De Beers Canada Exploration Inc.	2001-2002	AM, AEM, DD-4-3m	2.23977	T-4714
Aguonie	Getty Mines Limited	1972	Ground EM and mag	donation	WP Aguonie-11
Rabazo	Algoma Ore Properties, Limited	1955	Property examination	donated	WP Rabazo-40
Thorneloe	Comaplex Minerals Corp.	2002	DD-1-323m (lithogeochemical report)	2.24503	T-4768
Brackin	Cerro Mining Company of Canada Limited	1970	AEM, Magnetometer, Geology	donated	WT Brackin-51
Brackin	Cerro Mining Company of Canada Limited	1970	Geology, AEM, Magnetometer	donated	WT Brackin-50
Glasgow	Cerro Mining Company of Canada Limited	1970	Geology, AEM Survey	donated	WP Glasgow-16
Brackin	Cerro Mining Company of Canada Limited	1970	AEM, Mag surveys	donated	WT Brackin-49
Brackin	Cerro Mining Company of Canada Limited	1970	AEM Survey	donated	WT Brackin-48
Meath	Cerro Mining Company of Canada Limited	1970	AEM Survey	donated	WP Meath-14
Brackin	Cerro Mining Company of Canada Limited	1970	AEM Survey	donated	WT Brackin-46
Rennie	Cerro Mining Company of Canada Limited	1970	Radem, AEM Survey, ground mag	donated	WP Rennie-18
Stover	Cerro Mining Company of Canada Limited	1970	AEM, Mag, Geology	donated	WP Stover-13
Rennie	Cerro Mining Company of Canada Limited	1970	Geology, AEM Survey	donated	WP Rennie-24
Rennie	Cerro Mining Company of Canada Limited	1970	Geology	donated	WP Rennie-23
Rennie	Cerro Mining Company of Canada Limited	1970	Trenching, AEM, magnetometer, geology	donated	WP Rennie-22
Rennie	Cerro Mining Company of Canada Limited	1970	AEM Survey	donated	WP Rennie-21
Rennie	Cerro Mining Company of Canada Limited	1970	Geology, VLF-EM, AEM, Magnetometer	donated	WP Rennie-20
Brackin	Cerro Mining Company of Canada Limited	1970	Geology, AEM, magnetometer	donated	WT Brackin-47
Stover	Cerro Mining Company of Canada Limited	1970	AEM Survey, Geology	donated	WP Stover-14
Rennie	Cerro Mining Company of Canada Limited	1970	Geology	donated	WP Rennie-19
Pitt	McKinnon, D.	2002	Str	2.24523	T-4769
Mann	First Point Minerals Corporation	2002	DD-3-468m	2.23980	T-4771
Jessop, Murphy	Gervais, L.N.	2000-2002	Lc, HLEM surveys, Pr	2.24244	T-4770
Shaw	Cole, B.L.		IP, VLFEM	2.24582	T-4772
Chabanel	Algoma Ore Properties, Limited	1993	Property review	donation	WP Chabanel-53
McMurray	Pursides Gold Mines Limited	1975	Ore reserve calculation, ore recovery testing	donation	WP McMurray-85
McMurray	Golden Shamrock Resources Limited	1984	Property report	donation	WP McMurray-86

Township Area	Company Name	Year	Work Type	AFRO No.	T-File No.
Naveau	First Canadian Energy Corporation	1984	Property report	donation	WP Naveau-15
McMurray	Citadel Gold Mines Inc..	1986-1987	Property evaluation; exploration progress report	donation	WP McMurray-87
Finan, Jacobson	Canada Tungsten Mining	1994	Compilation report	donation	WP Jacobson-77
Brimacombe, Bullock	Algoma Central Railway	1961-1963	Geological compilation	donation	WP Bullock-12
Vasiloff, McDowell, Memaskwosh, Chapais, Alancn, McDowell, Charbonneau, Warpula, Groscilliers, Bostwick, Franchere, St. Germain, Mishibishu Lake Area, Levesque, Legarde, Killins, Keating	Algoma Central Railway	1961-1963	Geological compilation, air photo interpretation, quaternary compilation	donation	WP Vasiloff-12
Esquega, Chabanel, Bailloquet, Andre, Macaskill, Menzies, Musquash, Corbiere, Abotossaway, Leclaire, Lalibert, Knicely, McGowan, Dambrossio, Dumas, Dunphy, Chenard, Carmody, Bernst, Ashley, Broughton, Atkinson, Tilston	Algoma Central Railway	1961-1964	Quaternary Compilation, Air Photo Interpretation	donation	WP Tilston-11
Jessop, Murphy	Gervais, L.N.	2002	EM, clearing, line-cutting, ground gravity survey	2.24254	T-4773
Waswa, Wawia, Tabobondung, Suganaqueb, Stoney, Nebonaipnquet, Restoule, Recollect, Quill, Pawis, Noganosh, Nadjiwon, Miskokomon, Michano, Maness, Emiry, Eaket, Corboy, Cannard, Beaudin, Beaudry, Beauparlant, Behmann	Algoma Central Railway	1961-1963	Geological Compilation, Air Photo Interpretation, Quaternary Compilation	donation	WP Waswa-11
Bostwick, Lendrum, McMurray, Lastheels, Nebonaionquet, Naveau, Rabazo, Dulhut, Laronde, Peterson, Redsky, Restoule, Allouez, Tiernan, Stone, Stoney, Alaric, Asselin, Barager, Barnes, Bray, Brimacombe, Broome, Bullock	Algoma Central Railway	1961-1963	Geological compilation, Air photo interpretation, Quaternary geology	donated	WP Bray-11
Eaket, Emiry, Corboy, Cannard	Algoma Central Railway	1961-63	Geological Compilation	donation	WP Eaket-2
Pearkes, St.Julien, Challener, Acton, Meath, Glasgow, Leguerrier, Huotari, Finan, Jacobson, Riggs, West, Copenace, Bruyere, Bird, Aguonie, Cowie, Debassige, Dolson, Echum, Fiddler, Isaac, Keesickquayash, Laforme	Algoma Central Railway	1961-63	Geological Compilation, Air Photo Interpretation, Quaternary Compilation	donation	WP Pearkes-11
Pearkes, St.Julien, Challener, Acton, Abraham, Point Isacor, Groscilliers, Franchere, Bostwick, Hunt, Tilston, Atkinson, Broughton, McGowan	Algoma Central Railway	1960-1963	Geological Compilation, Quaternary Compilation	donation	WP Michipicoten Island-4
BMA 527 834 Area	Navigator Exploration Corp.	Jan-Nov 2002	DD-1-116m	2.24624	T-4776
Loveland	Meunier, D.	Nov 2002	Borehole Pulse EM survey-1-350m	2.24645	T-4775
Macklem	St. Andrew Goldfields Ltd.	Nov 2002	Plugger Drilling-1-7.3m	2.24614	T-4774
Prosser, Carnegie	Kidd Creek Mines Ltd.	1986	Property rep'ts.	donation	T-4778
Bradburn	Big Red Diamond Co.	2002	Samp., Plugger drilling-1-15.5m	2.24613	T-4777

Table 18. Publications received by the Timmins Regional Resident Geologist's Office in 2002.

Title	Author	Type and Year of Publication
Report of Activities, 2001, Resident Geologist Program: Timmins and Sault Ste. Marie Districts	Atkinson, B.T., Hailstone, M., Seim, G.Wm., et al.	OGS Open File Report 6082
Geological compilation of the Swayze area, Abitibi greenstone belt	Ayer, J.A. & Trowell, N.F.	Map P.3511
Geological compilation of the Swayze area [CD]	Ayer, J.A., Trowell, N.F., Valade, L., et al.	OGS MRD 93
Summary of Field Work and Other Activities, 2002	Baker, C.L., Debicki, E.J., Kelly, R.I. & Parker, J.R., eds.	OGS Open File Report 6100
Report on an exploration of portions of the Attawapishkat & Albany Rivers--Lonely Lake to James Bay	Bell, R.	GSC Publication, 1886
BGS Rock Classification Scheme, Volumes 1, 2, 3 & 4: Classification of: igneous, metamorphic, sedimentary rocks & artificial deposits	British Geological Survey	Text/Report, 1999
The geology, geochemistry, mineralogy and mineral beneficiation of platinum group elements [CD]	Cabri, L.J., ed.	CIM Special Volume 54
Superior PGE 2001: CIM Field Conference, Sept. 16 - 19, 2001, Thunder Bay, Ontario	CIM, Thunder Bay Branch	Field Guide, 2001
Report of Activities, 2001, Resident Geologist Program: Regional Land Use Geologist Report	Debicki, R., Drost, A., Rowell D. & Yule, G.	OGS Open File Report 6085
Timmins Airborne MegaTEM Survey – Buskegau R.	FedNor, Falconbridge Limited, OGS & GSC (Discover Abitibi)	Maps 81 749 – 81 752 (GSC OF4444 – OF4446)
Timmins Airborne MegaTEM Survey – Kamiskotia Lk	FedNor, Falconbridge Limited, OGS & GSC (Discover Abitibi)	Maps 81 741 – 81 744 (GSC OF4452 – OF4454)
Timmins Airborne MegaTEM Survey – Manning Lk	FedNor, Falconbridge Limited, OGS & GSC (Discover Abitibi)	Maps 81 745 – 81 748 (GSC OF4448 – OF4450)
Timmins Airborne MegaTEM Survey – Pamour	FedNor, Falconbridge Limited, OGS & GSC (Discover Abitibi)	Maps 81 737 – 81 740 (GSC OF4456 – OF4458)
Timmins Airborne MegaTEM Survey	FedNor, Falconbridge Limited, OGS & GSC (Discover Abitibi)	Maps 81 728 – 81 736 (GSC OF4434 – OF4442)
Genesis of the Deloro Township talc-magnesite deposit, Ontario, Canada	Griffis, R.J.	Thesis, 1970
Precambrian geology of Denton and Carscallen townships	Hall, L.A.F. & Smith, M.D.	OGS Open File Report 6093 with Map P..3517
The geological evolution of the Archean Swayze greenstone belt, Superior Province, Canada (in 3 volumes--see GSC OF 3384 for Vol. 2)	Heather, K.B.	Thesis, 2001
Magmatic Ni-Cu ± PGE occurrences and mafic-ultramafic bodies in Ontario [CD]	Hulbert, L. & Vaillancourt, C.	OGS MRD 100
Kabinakagami Lake area high density regional lake sediment and water geochemical survey, Northern Ontario	Jackson, J.E.	OGS Open File Report 6098

Title	Author	Type and Year of Publication
Lake sediment and water geochemical data from the Kabinakagami Lake survey area, Northern Ontario [diskette]	Jackson, J.E.	OGS MRD 110
Precambrian Geology Compilation Series – Michipicoten sheet	Johns, G.W. & McIlwraith, S.	Map 2669
Physical volcanology and petrogenesis of intrusive and extrusive komatiites in the Shaw Dome area, Abitibi greenstone belt	Larson, M.S.	Text/Report, 1996
Report of Activities, 2001, Resident Geologist Program: Red Lake and Kenora Districts	Lichtblau, A., Hinz, P., Ravnaas, C., et al.	OGS Open File Report 6079
Petrology and geochemistry of the Nipissing gabbro: exploration strategies for nickel, copper, and platinum group elements in a large igneous province.	Lightfoot, A.C. & Naldrett, A.J.	OGS Study 58, 1996
Geology of Burrows, Kemp and Mond townships, Shining Tree area	Machado, G.	OGS Open File Report 6077 with Map P.3445
Report of Activities, 2001, Resident Geologist Program: Thunder Bay North District	Mason, J.K., White, G.D., Scott, J.F., et al.	OGS Open File Report 6080
Report of Activities, 2001, Resident Geologist Program: Kirkland Lake and Sudbury Districts	Meyer, G., Cosec, M., Grabowski, G.P.B., et al.	OGS Open File Report 6083
Miscellaneous data related to the Wawa Quaternary geology mapping project, NE Ontario [diskette]	Morris, T.F.	OGS MRD 73, 2001
Quaternary geology, Roche Lake area	Morris, T.F.	Map 2672
Quaternary geology, Opasatika Lake area	Morris, T.F.	Map 2673
Quaternary geology, Woman Falls area	Morris, T.F.	Map 2674
Quaternary geology, Wakusimi River area	Morris, T.F.	Map 2675
Results of modern alluvium sampling, Kapuskasing–Fraserdale area, NE Ontario: Kapuskasing structural zone [diskette]	OGS – Operation Treasure Hunt	OGS MRD 68, 2001
Modern alluvium data release, Foleyet area, NE Ontario: Kapuskasing structural zone [diskette]	OGS – Operation Treasure Hunt	OGS MRD 83, 2001
Whole rock lithogeochemical data of prospective versus barren volcanic belts for volcanogenic massive sulphide (VMS) deposits, Superior Province [CD]	OGS – Operation Treasure Hunt	OGS MRD 85, 2001
Modern alluvium data release, Coral Rapids area, NE Ontario: Kapuskasing structural zone [2 diskettes]	OGS – Operation Treasure Hunt	OGS MRD 87, 2001
Regional GIS data base for the Abitibi greenstone belt [2 CDs]	Panagapko, D.A., Harris, J.R., Valade, L. & Ayer, J.A.	OGS MRD 99 / GSC OF4295

Title	Author	Type and Year of Publication
A compilation of references for kimberlite, diamond and related topics [2 diskettes]	Sage, R.P. & Gareau, T.	OGS MRD 86, 2001
Geology of Chabanel, Esquega, Lastheels and McMurry townships, District of Algoma – geochemical tables [diskette]	Sage, R.P.	OGS Dataset to accompany Open File Report 5586, 1993
Geology of Abotossaway, Corbiere, Leclaire and Musquash townships and part of Dunphy Township – geochemical tables [diskette]	Sage, R.P.	OGS Dataset to accompany Open File Report 5587, 1993
Geology of Aguonie, Bird, Finan and Jacobson townships, District of Algoma – geochemical tables [diskette]	Sage, R.P.	OGS Dataset to accompany Open File Report 5588, 1993
Report of Activities, 2001, Resident Geologist Program: Southeastern Ontario, Southwestern Ontario, Mines & Minerals Information Centre and Petroleum Resources Centre	Sangster, P.J., McGuinty, W.J., Papertzian, V.C., et al.	OGS Open File Report 6084
Precambrian Geology Compilation Series – Schreiber sheet	Santaguida, F.	Map 2665 Revised
Precambrian Geology Compilation Series – White River sheet	Santaguida, F.	Msp 2666
Report of Activities, 2001, Resident Geologist Program: Thunder Bay South District	Schnieders, B.R., Scott, J.F., Smyk, M.C., et al.	OGS Open File Report 6081
Experimental melting of phlogopite-calcite assemblages: Applications to the evolution and emplacement of silicocarbonatite magmas in the crust	Slagel, M.M.	Thesis, 1999
Precambrian geology, Yelling Lake area	Stone, D. & Hallé, J.	Map P.3518
Indicator minerals for kimberlite, base metals and gold: northern Superior Province, Ontario [diskette]	Stone, D.	OGS MRD 84, 2001
Toward a new metamorphic framework for gold exploration in the Timmins area, Central Abitibi greenstone belt	Thompson, P.H.	OGS Open File Report 6101
Minerals Yearbook: Area Reports: Domestic 1999, Volume II	US Geological Survey	Text/Report, 1999
OGS Editorial Guide, Fourth Edition	Weatherston, A.J.	OGS Misc. Paper 165, 1996
Diamonds in Late Archean calc-alkaline lamprophyres, Ontario, Canada: origins and implications	Williams, F.	Thesis

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All maps listed were published by the Ontario Geological Survey (OGS) unless otherwise noted.
GSC: Geological Survey of Canada
MRD: OGS Miscellaneous Release—Data

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Ontario

Ontario Geological Survey
Regional Resident Geologist's Program

Timmins Regional Resident Geologist
(Sault Ste. Marie District)–2002

by

M. Hailstone and D. Farrow

2003

CONTENTS

Sault Ste. Marie District–2002

INTRODUCTION 1
QUARRYING ACTIVITY 1
Ontario Trap Rock (A Division of R.W. Tomlinson Limited) 1
Gilbertson Enterprises Quarry 1
Nestorville Quarry 6
Root River Sandstone Quarry 6
Rancourt Quarry 6
EXPLORATION ACTIVITY 6
SouthernEra Resources Limited 7
Amerigo Resources Ltd – Iron Oxide-Copper-Gold Mineralization at the Island Copper and Coppercorp Mine 8
Intrepid Minerals Corporation and Falconbridge Limited 9
Eastmain Resources Inc. Plummer Additional – Olympic Dam-type Iron Oxide-Copper-Gold Project 9
LAND USE PLANNING ACTIVITY 11
SAULT STE. MARIE DISTRICT STAFF ACTIVITIES 11
PROPERTY EXAMINATIONS 14
O'Connor Daisy Stone Property 14
RECOMMENDATIONS FOR EXPLORATION 14
Gold Mineralization Possibilities in the Archean Batchawana Greenstone Belt 14
Iron Oxide-Copper-Gold (IOCG) Exploration Targets in the Sault Ste. Marie District 16
REFERENCES 21

Tables

Table 1. Exploration activity in the Sault Ste. Marie District in 2002. 2
Table 2. Assessment files received in the Sault Ste. Marie District in 2002. 11
Table 3. Property visits completed by the Sault Ste. Marie District office 2002. 13
Table 4. Publications received by the Sault Ste. Marie District Office in 2002. 17
Table 5. Mineral deposits not being mined in the Sault Ste. Marie District in 2002. 18

Figures

Figure 1. Exploration activity (keyed to Table 1) and staking in the Sault Ste. Marie District between Feb. 16, 2002 and Feb. 4, 2003. 3
Figure 2. Active claims and land disposition in Sault Ste. Marie District 4
Figure 3. Property visits and quarry locations. 5
Figure 4. Batchawana greenstone belt showing Grunsky's synclinal axis and deformation zone recommended for gold prospecting. 16

TIMMINS REGIONAL RESIDENT GEOLOGIST SAULT STE. MARIE DISTRICT–2002

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INTRODUCTION

Mineral production from the Sault Ste. Marie District during 2002 consisted of bedrock aggregate from 4 established quarries. A total of 30 individuals and companies are known to have performed mineral exploration and prospecting in the district during the year. Diamonds, gold and copper, including IOCG (iron oxide-copper-gold) mineralization were the major focus of exploration in 2002. Other exploration targets included platinum group metals and base metals. Details on exploration activity can be found in the text and by reference to Table 1 and Figures 1 and 2.

QUARRYING ACTIVITY

Production continued from 4 of 5 bedrock quarries established in the Sault Ste. Marie District. The quarries are keyed to Figure 3.

Ontario Trap Rock (A Division of R.W. Tomlinson Limited)

Ontario Trap Rock (map reference A, Figure 3) continued quarrying crushed bedrock aggregate from Nipissing diabase at their operation located 3 km east of the town of Bruce Mines in Plummer Additional Township. R.W. Tomlinson Limited produces approximately 800 000 tonnes of high-quality aggregate from this facility yearly for the construction industry.

The operating season begins in March and normally ends in November, with 25 people employed on a seasonal basis. About 90% of the aggregate product is transported by ship from Ontario Trap Rock's deep-water port on Lake Huron, with the remaining product transported by rail and truck. During the early part of the 2002 shipping season, lake water levels were reported to be higher than in recent years allowing increased shipment size with resulting lower costs. During the latter part of the season, water levels once again fell to lower than normal, resulting in smaller shipments. Production and sales during the year are governed by market demand, with a production goal pegged at 1 million tonnes in 2003. The quarry has an estimated $2 million impact on the area economy (G. Gautier, Ontario Trap Rock, personal communication, 2003).

Gilbertson Enterprises Quarry

Gilbertson Enterprises (map reference B, Figure 3) of St. Joseph Island operates a quarry, which is east of Highway 548 and south of Highway 17 in Tarbutt Additional Township. The quarried rock is a reddish pink to grey granophyre, a late differentiate typical of Nipissing diabase found in the Bruce Mines area. Several sizes of aggregate and landscaping products are obtained from crushing and screening operations. Production decreased in 2002 to approximately 17 000 tonnes in response to reduced local demand. Deliveries in 2002 were drawn principally from stockpiles and some additional quarrying. In addition to quarrying, Gilbertson supplies equipment and custom crushing services to quarriers throughout northern Ontario (S. Eddy, Gilbertson Enterprises, personal communication, 2003).

Table 1. Exploration activity in the Sault Ste. Marie District in 2002.

Abbreviations

Au	Gold	KIM	Kimberlite indicator mineral sampling
BM	Base metals	OPAP	Ontario Prospectors Assistance Program
Cu	Copper	Pb	Lead
Dia	Diamond	PGE	Platinum group element(s)
IOCG	Iron oxide-copper-gold	REE	Rare earth element(s)

No.	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity (Incentive Program)
1	Benninghaus, W.	Palmer (IOCG)	Prospecting, sampling
2	De Carle, R.	Proctor (PGE)	Prospecting, sampling
3	Eastmain Resources, Inc.	Plummer Additional (IOCG)	Prospecting, mapping
4	Fox Creek Investments Ltd.	Moggy (Au, BM)	Prospecting
5	Fudge, D.T.	Lewis, Striker (Cu)	Prospecting
6	Hicks, C.R & Lucuik, G.	VanKoughnet (low alpha Pb)	Prospecting, sampling, assays
7	Julien, P.B.	Dagle (Dia)	Prospecting
8	Leahy, P.F.	Palmer (IOCG, Cu-Au)	Prospecting
9	McDonald, A.W.	Olsen (Au)	Prospecting, sampling
10	Morra, P. & Venn, V.	Scriven (Au)	Prospecting, sampling
11	Morrison, D. M.	Lewis (PGE)	Prospecting, sampling
12	Amerigo Resources	VanKoughnet, Aweres (IOCG, Cu-Au)	Diamond drilling
13	Nicholson, T.S.	Ryan (IOCG, Cu-Au)	Prospecting, sampling
14	Pelky, R.J.	Lewis (PGE)	Prospecting, sampling
15	Pipoli, D.N.	Gapp, Menard,Norberg, Pine, Reilly, Renwick, Ryan, Wells, Wishart, Wlasy (IOCG, Cu-Au, Dia, BM)	Prospecting, sampling, assays
16	Ralph, J.G.	Maeck (REE, Dia)	Prospecting, sampling
17	Robert, J. & Tremblay, M.	Moen (Au)	Prospecting, sampling, assays
18	Shelly, D.I.	Kincaid (IOCG, Cu-Au)	Prospecting
19	Skead Holdings Ltd.	Hughes (Dia)	Prospecting
20	SouthernEra Resources Limited	Lane (Dia)	Airborne geophysics, KIM sampling, ground geophysics
21	Stares, M.R.	Slater (IOCG)	Prospecting
22	Steed, C.M.	Spragge (PGE)	Prospecting
23	Tortosa, D.	Kincaid (IOCG)	Prospecting, mapping
24	Vance, J. & Ward, M.	Shedden (PGE)	Prospecting

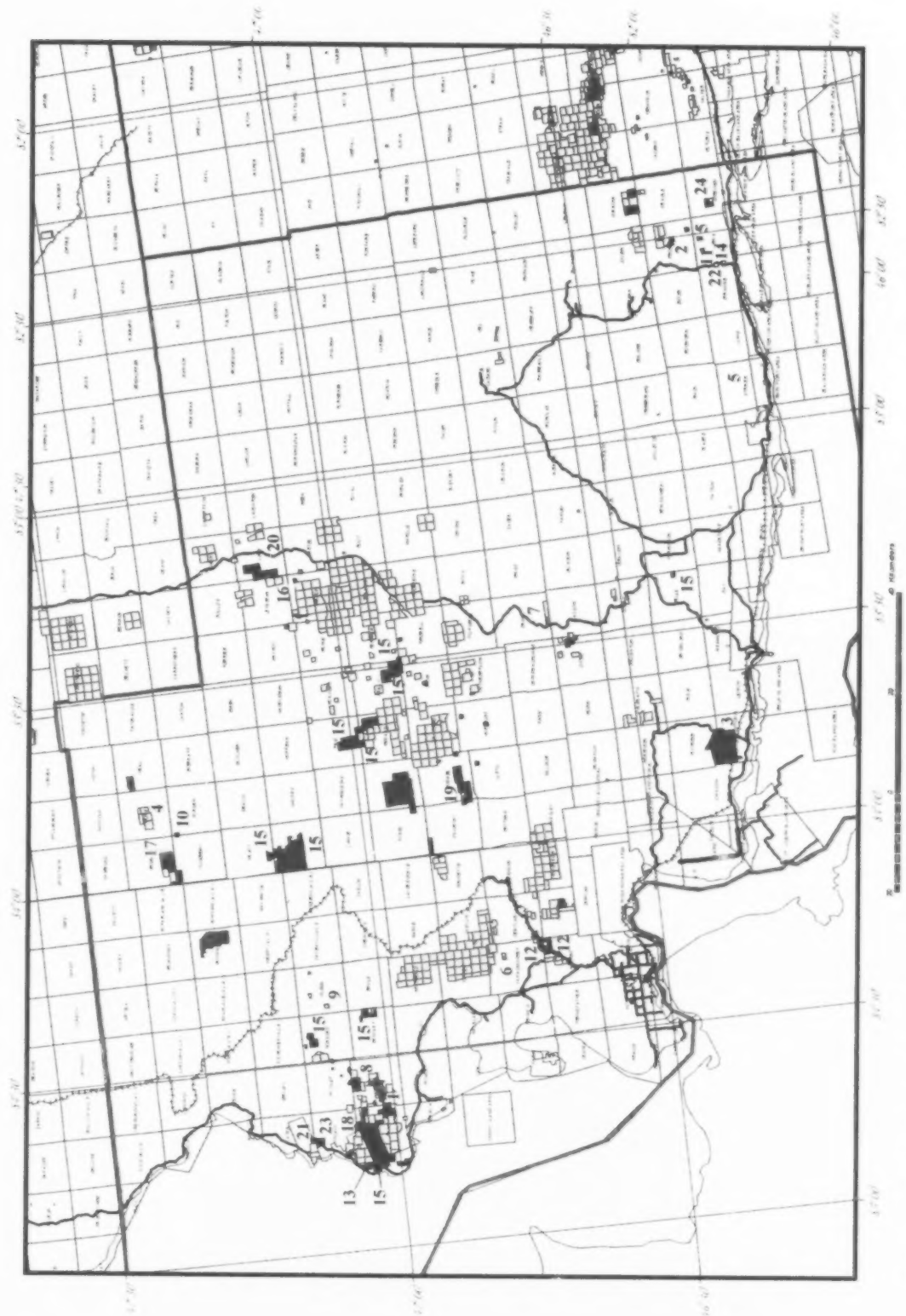

Figure 1. Exploration activity (Keyed to Table 1) and staking in Sault Ste. Marie District between Feb16, 2002 and Feb 4, 2003. New claims are indicated as dark colour. Some of the lighter coloured claims have since come open. see Figure 2.

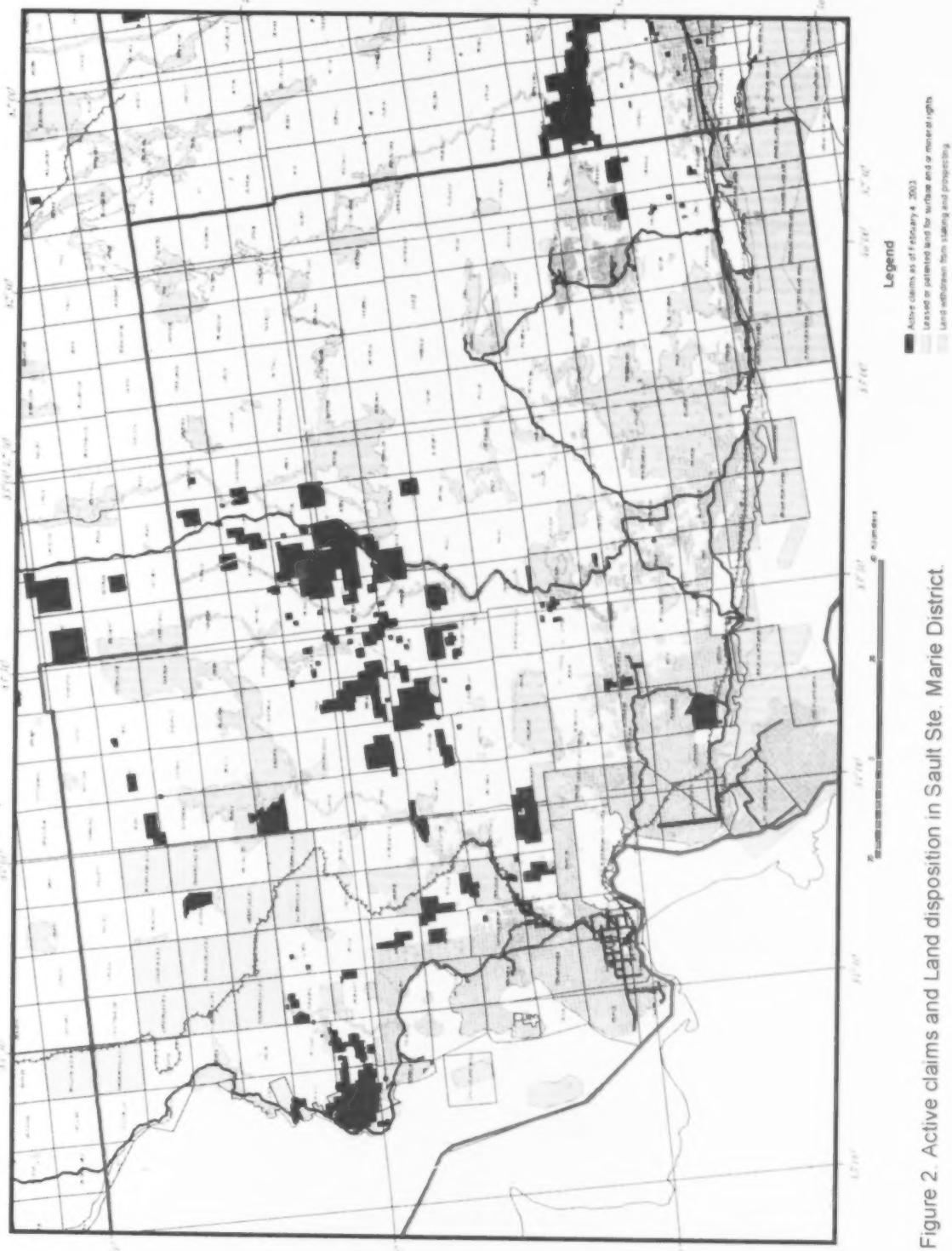

Figure 2. Active claims and Land disposition in Sault Ste. Marie District.

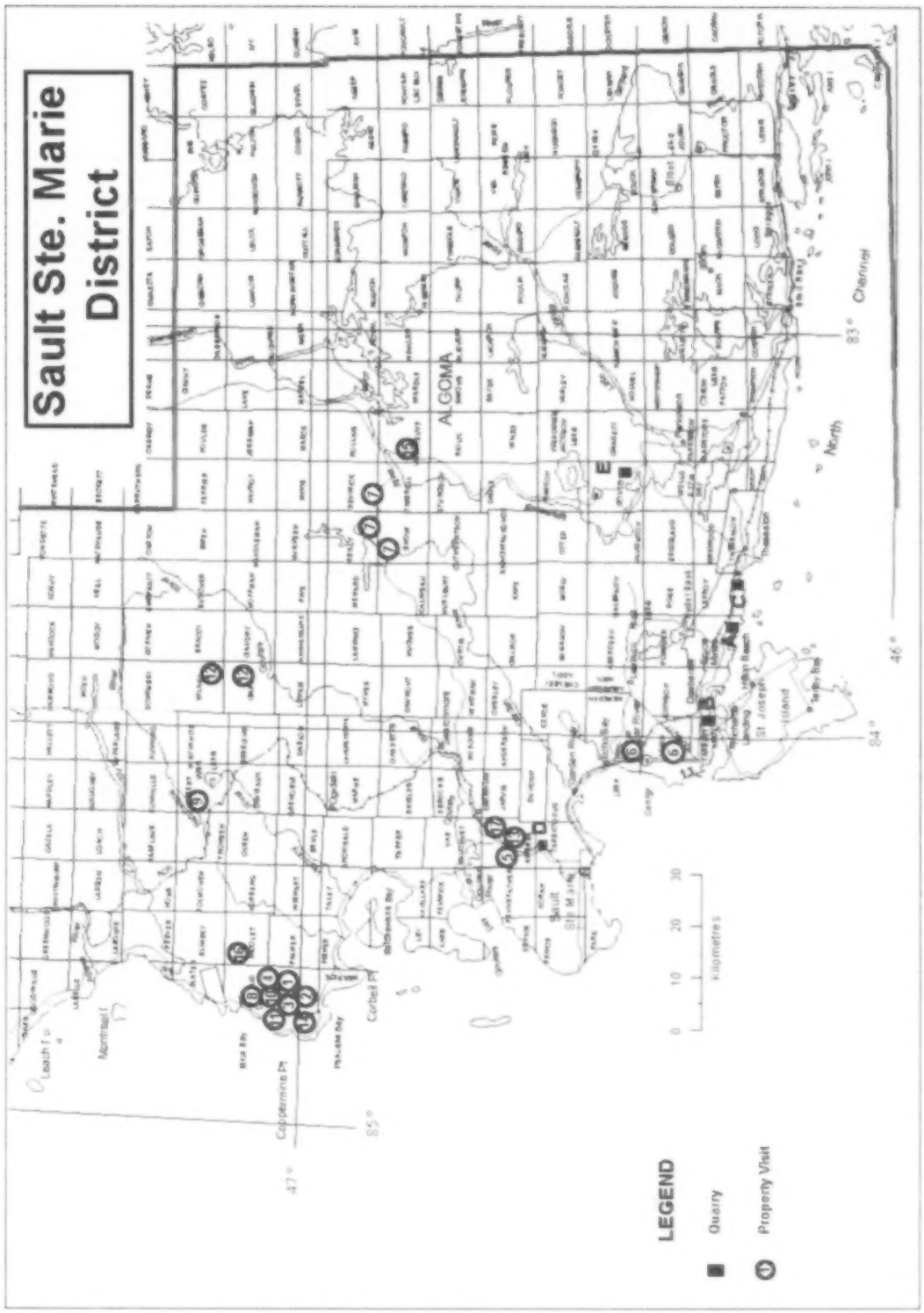

Figure 3. Property Visits and Quarry Locations

Nestorville Quarry

The Nestorville Quarry (map reference C, Figure 3) is located 4 km west of Thessalon, near the town of Nestorville in Lefroy Township. The quarry is operated by Smelter Bay Aggregates. Crushed Nipissing diabase is produced for a number of uses, chiefly rail ballast and quality construction aggregate used in fabricating high-strength concrete. Crushing is accomplished using contracted portable machinery with a yearly production capacity of approximately 1 million tonnes. Production was reduced in 2002 due to poor demand and low product prices (G. Goodmurphy, Nestorville Quarry, personal communication, 2003).

Root River Sandstone Quarry

Root River Sandstone Quarry (map reference D, Figure 3), operated by E. Kosiba, is located in Tarentorus Township within the city limits of Sault Ste. Marie. The quarry produces an attractive red flagstone from Jacobsville sandstone, which is used mostly for stone facing, flag walkways, retaining walls and landscaping. A new market was established in 2002 for sandstone boulders, with shipments to southern Ontario totalling 110 tonnes. Production of flagstone increased slightly again this year with a total of 115 tonnes extracted during the year (E. Kosiba, Root River Sandstone Quarry, personal communication, 2003).

Rancourt Quarry

The Rancourt Quarry (map reference E, Figure 3) is located approximately 41 km north of the town of Thessalon in Gould Township. Quarrying operations commenced in 1999, producing black argillite for use in the construction of fireplaces, walkways, outdoor stairs and patios. Quarrying was suspended during 2002 due primarily to a shortage of skilled labour (R. Bertolo, Rancourt Quarry, personal communication, 2003).

EXPLORATION ACTIVITY

During 2002, approximately 1230 mining claim units were staked in the Sault Ste. Marie District. A summary of exploration activity is reported in Table 1. Locations are shown on Figure 1.

Six companies contributed approximately $2.2 million to exploration expenditures in the Sault Ste. Marie District during 2002: Joint venture partners Canabrava Diamond Corporation and Kennecott Canada Exploration Inc., as well as SouthernEra Resources Ltd., are looking for diamonds in the area. Amerigo Resources Ltd., Intrepid Minerals Corporation and Falconbridge Limited Exploration are targeting IOCG (iron oxide-copper-gold) deposits. Both Amerigo and Intrepid Minerals finished the year with diamond drilling programs in Aweres and Ryan townships, respectively.

Canabrava Diamond Corporation and Kennecott Canada Exploration Inc. – Ontario Joint Venture Project

In June, Canabrava staked 38 additional claims in isolated, 4 claim unit blocks in several townships within the Ontario Joint Venture Project area. Prospecting and sampling continued on the Ontario Joint Venture Project until mid-November 2001. A total of 188 samples (predominantly till) were collected as follow-up to known positive sampling results in the area. Samples were sent to Kennecott's laboratory in Thunder Bay for initial processing. Heavy mineral concentrates were sent to Mineral Services in Cape Town for indicator mineral picking and electron microprobe analysis. Results are pending.

A fixed-wing geophysical survey was completed over the Green Block (3746 line-kilometres) in February and a a total of 51 targets were identified. Two additional fixed-wing geophysical surveys were completed in May 2002 over the Martel Block (4016 line-kilometres) and the Snow Block (4287 line-kilometres). These areas were defined on the basis of a comprehensive study of the relationship between indicator mineral dispersion patterns and Quaternary geology in the project area. An independent specialist in the Quaternary geology of Ontario was retained to complete this study.

Twenty-two magnetic anomalies in the Green and Martel blocks, selected from the 2001 fixed-wing geophysical survey, were flown with high-resolution helicopter-borne magnetometers in early February 2002. Based on these surveys, 5 drill targets were defined. All but one of these targets were accessible by road and drilling was completed by the end of May. Results are pending.

The initial data processing was completed in Canada and an expert kimberlite geophysicfst in Australia carried out the final interpretation of the results. Twenty-two and 23 targets were identified on the Snow and Martel blocks, respectively. The geophysical targets identified were followed up on the ground with prospecting, mapping and some additional sampling, enabling Canabrava geologists to prioritize the best potential kimberlite targets.

All picking and microprobe results for indicator mineral samples collected in 2001 were received and incorporated into the Canabrava database. These data augment results from previous phases of sampling and will be used to focus further prospecting and selection of targets for drilling.

The field program in Ontario commenced in early August 2002 with 2 geological field teams inspecting the sites of magnetic anomalies. Seventy geophysical anomalies were visited in the field in the Green, Martel and Snow geophysical blocks. The sites were inspected for outcrops of magnetic rock and, in the case of no surface exposure, the site was mapped and till samples were collected down-ice of the anomaly. Samples were immediately dispatched to Kennecott's laboratory in Thunder Bay. These sampling results will be used to prioritize the geophysical targets for drilling.

Exploration expenditures for the year were approximately $535 000 on the Ontario Joint Venture project (G.Read, Canabrava Diamond Corporation, personal communication, 2003).

SouthernEra Resources Limited

During 2001, SouthernEra Resources Limited staked 986 claim units in 13 townships in the vicinity of Menard, Reilly, Rollins, Renwick and Maeck townships. In 2002, an additional 64 claims were staked in Lane Township.

Following completion of a 6000 line-kilometres airborne geophysical survey and the release of a 105 000 line-kilometres government-funded (Fed-Nor) airborne geophysical survey in northern Ontario during 2001, SouthernEra secured the 100 percent-owned Majestic and Crown diamond projects. Ground magnetic, electromagnetic and gravity geophysical surveys were completed in 2002 to test a number of kimberlite targets initially identified in airborne surveys.

SouthernEra referred to their Ontario diamond exploration program in a short form prospectus published on June 18, 2002:

> "The selection of the two project areas is based upon the positive identification of high interest kimberlite pipe-like geophysical targets defined from both airborne surveys and coincident field relationships to positive kimberlitic indicator mineral results returned from stream and till sampling surveys conducted by both SouthernEra and the government of the Province of Ontario. SouthernEra has now staked over 25,000 hectares of land that covers more than 200 individual kimberlite pipe-like airborne geophysical targets. First phase till and stream sampling and systematic prospecting follow-up exploration programs on selected airborne geophysical targets were completed at both the Majestic and Crown projects during 2001. The sampling programs have recovered high interest kimberlitic garnets, diamond inclusion chromites, ilmenite and chrome diopside. The kimberlitic indicator mineral chemistry data suggest the presence of diamondiferous source rocks within both projects. In addition, prospecting has resulted in the discovery of two kimberlite dykes and float material that hosts kimberlitic indicators".

By September 30, 2002, SouthernEra Resources Ltd. had spent US$1.082 million to date on their exploration activities at their Superior Diamond project (SouthernEra Resources Ltd., 3rd Quarter financial report 2002).

Amerigo Resources Ltd – Iron Oxide-Copper-Gold Mineralization at the Island Copper and Coppercorp Mine

In May, Amerigo Resources announced that it had signed an option agreement with Sault Ste. Marie prospector George Lucuik to earn a 100% interest in the Deroche property, located in Deroche Township. In order to earn the interest, the company must issue 30 000 shares and spend $30 000 on exploration on the property over 2 years. The 208-hectare (12 claim units) Deroche property covers a fault-bounded block of sedimentary rocks of the Huronian Supergroup intruded by Nipissing diabase within Archean granite. The southernmost fault is an extension of the regional-scale Bellevue fault, known to contain hematite occurrences. Hematite occurs on the Deroche property as veinlets associated with quartz veins and stockworks in the granite.

Amerigo also staked the Bellevue property (44 claim units - approximately 704 hectares) in Aweres and VanKoughnet townships near Sault Ste. Marie. The claims cover the intersection of the Highway fault separating Archean gneiss from Proterozoic sedimentary and volcanic rocks, and a regional-scale, north-northwest-trending fault. A copper occurrence is located near this fault intersection, and hematite is reported to be associated with the north-northwest-trending fault. The Bellvue property adjoins the Island Copper property to the east and west. Amerigo can earn a 55% stake in the Island Copper property by issuing 200 000 shares to Falconbridge Limited and spending $250 000 on exploration over 3 years.

Amerigo completed a diamond-drilling program on the Island Copper property on December 19, 2002. A total of 992 m of drilling in 4 holes tested the depth extent and continuity of previously outlined copper and gold mineralization as well as coincident chargeability and residual gravity anomalies. The target of exploration at Island Copper is Olympic Dam-style copper-gold mineralization associated with brecciated albite granite.

> "The best results came from hole IC02-1 which intersected a near-surface interval of 1.5% Cu and 0.2 g Au/t over eight meters that included 4.4% Cu and 0.5g Au/t over two meters. The copper occurs mainly as chalcopyrite veins and disseminated in the matrix of brecciated albite granite. Specular hematite also occurs as veins and occasional disseminated grains throughout the matrix. Hematite-altered, brecciated granite gneiss was intersected over 37.72 meters in hole IC02-4, drilled 526 meters west of Hole IC02-1 to test a coincident gravity and chargeability anomaly."
> (Amerigo Resources Ltd., press release, February 5, 2003)

Amerigo is integrating the recent drilling data with historical work to plan a 2003 exploration program for the Island Copper property.

A recent article in *The Northern Miner* states that in September, Amerigo announced its acquisition of the Coppercorp Mine property from local Sault Ste. Marie prospectors and

> "subsequently began sampling two copper showings discovered earlier in the summer, plus several others in the vicinity of the mine site. The new Tower and A1 showings yielded anomalous values only, but others carried as much as 10.71% copper and 5.3 grams gold per tonne."
>
> Amerigo plans to complete "geophysical surveying to assess the showings and other known targets [on the Coppercorp property]. Two of those targets are untapped areas of the former mine and possible strike extensions to the northwest and south. To earn 100% interest, Amerigo must spend $200 000 on exploration, issue 600 000 shares and pay $100 000 in cash, of which 70% may be paid in shares."
>
> Two types of mineralization occur on the property. At the Tower showing, mineralization is described as "chalcopyrite and malachite, typically with hematite and quartz-carbonate veining, hosted by amygdaloidal basalt or conglomerate." Mineralization at the A1 showing is described as "disseminated chalcopyrite and malachite, with accessory magnetite, in epidote-altered mafic volcanics and dykes associated with a brecciated felsic intrusive." (*The Northern Miner*, February 2003, v.88, no.50, p.11).

D. Tortosa has prepared a comprehensive description of the style of mineralization as a prospectus on the Coppercorp Mine and Montreal Mining Location for Amerigo. That report is posted on the Amerigo web site at http://www.amerigoresources.com/_resources/properties/coppercorp/CoppercorpTR0902.pdf (accessed March 27, 2003).

Intrepid Minerals Corporation and Falconbridge Limited

As a result of the June 1, 2002, openings, 228 claim units were staked on the Montreal Mining Location in Ryan Township by a group of local prospectors and Intrepid Minerals Corporation. These claims targeted copper and silver mineralization associated with the Coppercorp Mine.

Intrepid Minerals Corporation and Falconbridge Limited formed a strategic alliance to explore for IOCG (iron oxide copper-gold) deposits within the Circum-Superior region in 2001. As part of this agreement, Intrepid, as operator, is required to incur expenditures totaling $950 000 over 3 years, commencing January 1, 2002. The schedule for expenditures requires Intrepid to spend $300 000 in each of the first and second years, followed by $350 000 in the third year. On signing, Falconbridge agreed to complete a private placement in Intrepid in the amount of $150 000 for which Intrepid issued 375,000 units. Under the terms of the agreement, Falconbridge has a right to enter into an option agreement with Intrepid on any target property identified as a result of the exploration work within the Circum-Superior corridor (Intrepid Minerals Corporation, press releases, 2001).

In June 2002, Intrepid Minerals Corporation reported that it had entered into an option agreement with 3 individuals to explore claims in Ryan Township for iron oxide-copper-gold (IOCG) deposits. The property consists of 118 units in 2 adjoining blocks that are held under a strategic alliance between Intrepid and Falconbridge Limited as part of their Circum-Superior IOCG program. The region hosting the claims has many characteristics associated with this style of world-class copper-gold deposits. Mineralization on the claims consists of copper-gold in conjunction with hematite and is associated with several geophysical anomalies and significant gravity anomalies.

In August 2002, Intrepid Minerals reported that geophysical and geological surveys continued at the Ryan Lake project in partnership with Falconbridge. A number of significant gravity and magnetic anomalies have been delineated, some of which are associated with magnetite-amphibole-chalcopyrite mineralization. Further gravity profiles were completed in the third quarter of 2002.

In December 2002, Intrepid announced plans to commence diamond drilling on several IOCG-style targets identified on the 35 km^2 Ryan Township property. This project is being explored as part of the Circum-Superior strategic alliance with Falconbridge Limited, who have the right to earn a 50% interest in the project. During 2002, Intrepid outlined a number of geophysical anomalies with associated mineralization characteristic of iron oxide-copper-gold (IOCG) systems, otherwise referred to as Olympic Dam deposits. A total of 8 priority targets have been identified which will require drill testing over the next 12 months (Intrepid Minerals Corporation, 2nd Quarter financial statements, August 29, 2002).

Eastmain Resources Inc. – Plummer Additional – Olympic Dam-type Iron Oxide-Copper-Gold Project

In December 2002, Eastmain Resources Inc. restaked 192 claim units in Plummer Additional Township for IOCG mineralization. During the summer, a consulting geologist was retained to collect samples and complete geological mapping on the property.

The following material is from the Eastmain Resources Inc. web site (http://www.eastmain.com/):

> Eastmain Resources Inc. acquired an option to earn 100% interest in the Plummer Additional property from Phelps Dodge Corporation by incurring $300 000 in work expenditures over a three-year period. Phelps Dodge will retain a 2% Net Smelter Return Royalty subject to a buyout of one-half of the royalty.
>
> The project hosts eight copper, iron oxide ± uranium occurrences in Plummer Additional Township, located five kilometres north of the historic copper mining town of Bruce Mines and 60 kilometres east of Sault Ste. Marie, Ontario. The property consists of 13 staked claims (192 units) covering 3,072 hectares in Plummer Additional Township.
>
> Many characteristics of the world-class Olympic Dam deposit type of South Australia (2,320 million tonnes @ 1.3% Cu, 0.6 g/t Au, 0.4 kg/t U_3O_8) are represented at the Plummer property. These include: *i*) proximity to interpreted mid-continental rift systems; *ii*) prolific historical copper production from the area; *iii*) large-scale Proterozoic sedimentary breccias and magmatic rocks; and *iv*) widespread uranium, iron oxide and albite mineralization. No previous exploration has been completed on the

property for this deposit type. The Circum-Superior region of Ontario represents new hunting ground for IOCG deposits. Because of their extreme size and multi-metal content, Olympic Dam or IOCG deposits are attractive to senior mining companies.

The property is located within an east-west assemblage of Proterozoic age, igneous and sedimentary rocks that extend for 150 km from Sault Ste. Marie to Elliot Lake. Numerous copper, iron, gold and uranium occurrences are distributed throughout this belt. This region has many of the IOCG deposit characteristics with respect to age, rock type, metals and alteration.

Phelps Dodge identified the project area by screening the Ontario Geological Survey Petrock database for Proterozoic rocks with elevated albite ± magnetite concentrations. The area lies within a Proterozoic (Helikian) Huronian assemblage of sedimentary rocks consisting of Gowganda conglomerate, Lorrain quartzite and Serpent argillite formations intruded by Keweenawan diabase dykes and mafic sills. These sedimentary rocks are interpreted to be a rift fill and continental margin sequence. The region is bounded to the north by the Murray thrust fault and Great Lakes Tectonic Zone. Several large breccia bodies with copper ± uranium, albite (sodium enriched) and hematite-alteration are documented on the Property.

McGregor Road breccia – This unit comprises a 4 km long by 300 m wide zone along the south side of a wedge-shaped block of basal Lorrain arkose. It contains seven occurrences of radioactivity (uranium plus thorium) and thin, specular hematite veinlets in the eastern half of the breccia with pyrite in the western half. Breccia clasts include basal Lorain and Gowganda sediments and diabase. Fractured mudstones surrounding the breccia are extensively albitized, containing up to 10% Na_2O.

Steinburg Breccia – This quartz-carbonate, chalcopyrite/pyrite-cemented breccia zone formerly worked by Bruce Pesto Mines hosts a copper reserve of 112,700 tons at 1.1% Copper. The breccia zone includes silicified and hematized quartzite fragments. Albite alteration has also been recorded. Cu mineralization rims and absorbs clast boundaries and is associated with quartz veining. Historical diamond drill intersections include 1.44% Cu across 3.7 m and 3.97% Cu over 5.5 meters.

Bald Dome Breccia – This unit is described as having breccia fragments of diabase and siltstone that are silicified and hematized. Chalcopyrite with minor bornite and chalcocite occur in the matrix and partly replace some fragments. Copper grades reported range from 1-2%, with a previous drill intersection of 1% Cu across 9 meters.

Quartz Cu Veins – There are numerous quartz copper veins reported on the property, some with recorded tonnage (ie. Campbell Dukes with 33,000 tons grading 1.2% Cu).

Exploration History

1919: Mond Nickel Mines (Inco) – completed trenching on the Steinburg prospect and shipped 139 tons to Sudbury. Average grade of the shipment was 1.59% copper. One short drill hole was reported, but no data are available.

1941: Frobisher Mines – 3 diamond drill holes were completed under the Steinberg Zone.

1955: Bruce Presto Mines – completed 20,923 feet of drilling in 67 holes. Forty-seven holes were drilled on the Bald Dome, Steinburg and Campbell Dukes prospects. The remainder of the drilling focused on numerous quartz-copper veins on the property. Geological mapping, airborne EM and magnetic surveys were also completed.

1961: Bannockburn Exploration – completed 8 diamond drill holes on the Steinberg prospect. An IP survey covering the area between the Steinberg and Bald Dome prospects defined anomalies, but they were not tested. Minor soil sampling and petrographic work completed on the Steinberg prospect identified abundant albite alteration and ubiquitous hematite and magnetite.

The known mineralized zones have been adequately tested near surface, however they do indicate that the geology, alteration and metal assemblage is favourable for an IOCG deposit. Much of the property is overburden-covered and has not received any modern exploration. Phelps Dodge was successful in identifying an excellent early-stage IOCG prospect located with in a large belt prospective for these giant deposits. Eastmain is seeking a joint venture partner to earn a 50% interest in the project.

Although the property was restaked in December this year, the original option agreement is still in place between Phelps Dodge Corporation and Eastmain Resources Inc. Additional exploration is anticipated on the property during 2003 (C. Butella, Eastmain Resources Inc., personal communication, 2003).

LAND USE PLANNING ACTIVITY

Staff of the Sault Ste. Marie District Geologist Office provided ongoing input to the Ontario Living Legacy review process for sites regulated in 2002 in the Sault Ste. Marie District.

The office provided comments on the Earth Science component of the Great Lakes Heritage Coastline to the Ministry of Natural Resources district office in August and attended Algoma Headwater Signature Site public information sessions with Northeast Regional Land Use Geologist G. Yule in January 2003. These open house meetings were held in Searchmont, Sault Ste. Marie, Chapleau and Thessalon.

The District Geologist provided comments on 6 withdrawals of Mining Lands.

Mineral concerns maps and comments were provided to consultants working on the Official Plans for the Corporation of the townships of Blind River and Huron Shores.

Office staff attended Marshall, Macklin & Monaghan meetings held in Sault Ste. Marie regarding routing of the proposed city bypass.

Copies of maps and reports for Official Plans of municipalities within the District are kept on file at the Sault Ste. Marie District Geologist Office.

SAULT STE. MARIE DISTRICT STAFF ACTIVITIES

The office received 588 visitors and responded to 2235 telephone calls during the year. The Drill Core storage facility was visited by 6 clients. Assessment files and publications received in the Sault Ste. Marie office in 2002 are listed in Tables 2 and 4.

District Geologist M. Hailstone and District Support Geologist D. Farrow staff the Sault Ste. Marie office. B. Kraft, who worked as an experience student for the summer months of June through August, provided technical assistance. B. Kraft is currently enrolled in his first year as a geology student at Cambrian College in Sudbury, Ontario. The office provided a co-operative education student placement opportunity to one student from Sir James Dunn Collegiate and Vocational School: T.J. Cain worked from September until January assisting with various office functions, including assessment work filing, inventory, office renovation and Drill Core Library duties.

The District Support Geologist attended training sessions in Microsoft® Access 97, Customer Service Practises, Creative Thinking and Problem Solving, and in determining Provincially Significant Mineral Potential.

Staff of the District Geologist Office completed 17 field visits during the year (Table 3). Staff provided field trips to the area for prospectors, schools and industry, focusing on Keweenawan rocks of the Mamainse Point Formation.

In April, M. Hailstone attended the Northwestern and Northeastern Ontario Regional Mines and Minerals Symposia in Thunder Bay and Sudbury. In September, M. Hailstone attended the Resident Geologist's annual meeting in Sudbury. M. Hailstone and D. Farrow participated in Provincially Significant Mineral Potential training in Sudbury in January 2002.

During September and October, approximately 350 abandoned mine sites (AMIS) were documented by Sonic Soil Sampling Inc., subcontracting to Aqua Terre Solutions Inc. The data collected from these sites are available from the Abandoned Mines Co-ordinator, Ministry of Northern Development and Mines, Sudbury.

M. Hailstone and D. Farrow attended meetings and telephone conferences as part of the Economic Development team and the Natural Resource Sector team. In August, Regional Land Use Geologists took up representation by the Mines and Minerals Division at the Natural Resources Sector team meetings.

Table 2. Assessment files received in the Sault Ste. Marie District in 2002.

Abbreviations

AEM ..... Airborne electromagnetic survey
AM ..... Airborne magnetic survey
ARA ..... Airborne radiometric survey
Beep ..... Beep Mat survey
Bulk ..... Bulk sampling
DD ..... Diamond drilling
DDH ..... Diamond drill hole(s)
DGP ..... Down-hole geophysics
GC ..... Geochemical survey
GEM ..... Ground electromagnetic survey
GL ..... Geological survey
GM ..... Ground magnetic survey
GRA ..... Ground radiometric survey
Grav ..... Gravity survey
HLEM ..... Horizontal loop electromagnetic survey
HM ..... Heavy mineral sampling
IM ..... Industrial mineral testing and marketing
IP ..... Induced polarization survey
Lc ..... Linecutting
Met ..... Metallurgical testing
OD ..... Overburden drilling
ODH ..... Overburden drill hole(s)
OMIP ..... Ontario Mineral Incentive Program
OPAP ..... Ontario Prospectors Assistance Program
PEM ..... Pulse electromagnetic survey
PGM ..... Platinum group metals
Pr ..... Prospecting
RES ..... Resistivity survey
Samp ..... Sampling (other than bulk)
Seismic ..... Seismic survey
SP ..... Self-potential survey
Str ..... Stripping
Tr ..... Trenching
UG ..... Underground exploration/development
VLEM ..... Vertical loop electromagnetic survey
VLFEM ..... Very low frequency electromagnetic survey

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Aweres	Falconbridge Ltd.	2001	GL, GC	2.22991	SSMP Aweres-05
VanKoughnet	Lucuik, G.	2001	Tr, Str	2.22120	SSMP VanKoughnet-13
Aweres	Falconbridge Ltd.	2001	Grav	2.22973	SSMP Aweres-06
Aweres	Falconbridge Ltd.	2001	IP	2022969	SSMP Aweres-07
McMahon	Glanfield, M.	2001	Pr, Samp	2.23128	SSMP McMahon-01
Joubin	Pacific Northwest Capital Corp.	2001	Pr, Samp	2.23014	SSMP Joubin-13
Ryan	North Can. Ent. Ltd.		mine plans	donated	SSMP Montreal Mining Loc-04
Kincaid	O'Connor, T.	2001	Str	2.23612	SSMP Kincaid-16
Bouck	Spanish American Mines Ltd.		mine plans	donated	SSMP Bouck-04
Galbraith	North Huron Gold Mines Ltd.		mine plans	donated	SSMP Galbraith-06
Gould	Sudbury Basin Mines Ltd.		mine plans	donated	SSMP Gould-10
Gunterman	Rio Algom Mines Ltd. – Nordic Mine		mine plans	donated	SSMP Gunterman-07
Gunterman	Northspan Uranium Mines Ltd.		mine plans	donated	SSMP Gunterman-08
LaVerendrye	Superior Copper Company Ltd.		mine plans	donated	SSMP LaVerendrye-02
Spragge	Rio Tinto Management Services		mine plans	donated	SSMP Spragge-01
Spragge	Rio Algom Mines Ltd.		mine plans	donated	SSMP Spragge-02
Thompson	Bar-Fin Mining Corp. Ltd.		mine plans	donated	SSMP Thompson-06
VanKoughnet	Sill Lake Silver Mine		mine plans	donated	SSMPVanKoughnet-14
Rix	Ranwick Uranium Mines Ltd.		mine plans	donated	SSMP Rix-03
LaVerendrye	Supercrest Copper Mines Ltd.		mine plans	donated	SSMPLaVerendrye-03
Aweres	Amerigo Resources	2002	Compilation	donated	SSMP Aweres-08
Bouck	Denison Mines Ltd.		mine plans	donated	SSMP Bouck-05
Ryan	Coppercorp Mine		DD	donated	SSMP Montreal Mining Loc-05

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Ryan	Coppercorp Mine		mine plans	donated	SSMP Montreal Mining Loc-06
Sagard	White Lake Mines Ltd.		mine plans	donated	SSMP Sagard-03
Casson, Otter	Brunette, R.	2001	Pr, Samp	2.23513	SSMP Casson-11
Ryan	Coppercorp Mine		Tech. Report	donated	Ryan Mining Loc-12
Lefroy	Warren Paving Ltd.	2001	IM	2.24367	Lefroy-02
Vibert	Wilson		Pr, Samp	donated	SSMP Vibert-05
Wells	Ramsay	1940	Pr, Samp	donated	SSMP Wells-01
Deroche	Farmer-Scott	1953	Pr, Samp	donated	SSMP Deroche-08
Gunterman	Peters, L.	1947-51	Pr, Samp	donated	SSMP Gunterman-09
Joubin	Long Lac Mineral Exploration	1976-77	DD	donated	SSMP Joubin-14
Gaiashk	Beilhartz	1998	Pr, Samp	OP98-104	SSMP Gaiashk-09
Bouck	Kuryliw, C.	1968	DD	donated	SSMP Bouck-06

Table 3. Property visits completed by the Sault Ste. Marie District office 2002.

Number (keyed to Fig.2)	Property/Occurrence	Location
1	A1 chalcopyrite-magnetite occurrence	Ryan Township
2	Bill Gibbs showing	Ryan Township
3	Coppercorp Mine and vicinity	Ryan township
4	East of Montreal Mining Location	Ryan Township
5	Island Copper occurrence	Aweres Township
6	Jacobsville sandstone exposures	MacDonald and Laird townships
7	Lamprophyres along Ranger Lake Road	Reilly, Snow, Renwick townships
8	Mamainse Mine	Kincaid, Ryan townships
9	Mongoose Lake Road	Vibert Township
10	Montreal Mining Location East	
11	O'Connor Daisy Stone outcrops	Ryan Township
12	Outcrop along road	Wlasy and Gapp townships
13	Pants Lake road lamprophyre exposures	Aweres Township
14	Shafts on east side of tailings area, Montreal Mining Location	
15	SouthernEra Resources Ltd. heavy mineral mill	Aubrey Falls
16	Tribag Mine	Nicolet Township
17	Upper Island Lake, south and east side exposures	Aweres Township

PROPERTY EXAMINATIONS

O'Connor Daisy Stone Property

During the period 1999 to 2001, Sault Ste. Marie prospector T. O'Connor staked 8 claim units in Ryan and Kincaid townships to cover a porphyritic basalt occurrence mapped by Giblin (1969a, 1969b, 1973).

The property is located approximately 80 km north of Sault Ste. Marie along Highway 17. Access is by means of forestry roads leading eastward from the highway in 2 locations. The southernmost route leads about 6.5 km in from the highway. The first 5 km are negotiable by truck, but the final 1.5 km require the use of an all-terrain vehicle or may be hiked. The northern access route is shorter (2.5 km), but more rugged. The final 1.5 km may be traversed with difficulty by all-terrain vehicle or on foot.

The Daisy Stone property occurs as a northwest-striking unit, which crops out sporadically over a strike length of approximately 2 km and averages 100 m in width. The unit also crops out on the shore of Lake Superior approximately 3 km north of the property. Annells (1973) has described the unit as a glomerophyric flow, rich in calcic plagioclase laths grouped into spherulitic clusters up to 5 cm across. This texture resembles many flowering daisies.

In May and August of 2001, trenching, power stripping and washing were performed at 5 sites on the claims. Three of the sites produced good exposures of the Daisy Stone flow, while the other 2 sites displayed shearing and brecciation. The 3 washed sites were evaluated visually for use as dimension and decorative stone.

In August 2002, staff of the Sault Ste. Marie District Geologist's office visited the property. The 3 stripped and washed sites were examined for fracture density and homogeneity of colour and pattern. It was concluded that the stone would not be suitable for use as dimension stone because of the high degree of fracturing and inconsistent colour imparted mainly by patchy epidote alteration. Some areas showed promise as potential sources for extraction of ornamental stone.

RECOMMENDATIONS FOR EXPLORATION

Gold Mineralization Possibilities in the Archean Batchawana Greenstone Belt

The geology of the area has been described by a number of workers including Siragusa (1986), Grunsky (1980a, 1980b, 1981a, 1981b, 1991) and Wilson (1983).

The Batchawana greenstone belt has been described as 2 volcanic subdomains. The dominantly calc-alkalic Eastern Volcanic subdomain is 10 million years younger than the dominantly mafic Western Volcanic subdomain (Grunsky, 1991).

> "The Eastern Volcanic subdomain with its associated bimodal volcanism and extensive sedimentary accumulations is interpreted as an island arc sequence. Subsequent arc collision resulted in the Eastern Volcanic subdomain being thrust over the earlier mafic plain sequence of the Western Volcanic subdomain. Associated with the thrusting event was wide scale crustal assimilation, followed by the intrusion of the late post-kinematic plutons associated with the Ramsay Gneiss domain. This accreted package of domains forms part of the younger Abitibi subprovince . . . "

Grunsky's work also revealed a west-trending zone of pervasive carbonatization within metavolcanic and metasedimentary rocks between Hanes Lake in Gapp Township and the Meenach Lake area in Davieaux Township. The zone appears to cut across both eastern and western volcanic subdomain rocks, suggesting that the carbonatization is younger than the deformation and thrusting of the Eastern Volcanic subdomain over the Western

Volcanic subdomain. High-density lake sediment geochemistry completed by the Ontario Geological Survey for anomalous gold (>2.0 ppb) shows 5 anomalies coincident with the zone of carbonatization (OGS 1989). Gold grain counts from an OGS kimberlite indicator mineral sampling program reveal an area of concentration of high gold grain counts in the vicinity of Tronsen, Vibert and Olsen townships (OGS 2001).

The northwest-trending stratigraphy of, and foliation within, the Eastern Volcanic subdomain appear on Grunsky's map coincident with a synclinal axis and felsic metavolcanic rocks that extend northwesterly through Lunkie, Desbiens, Way-White, Vibert and into Runalls townships. This northwest-trending structural zone is under-explored and considered favourable for gold prospecting (Figure 4).

In the north part of Olsen and Davieaux townships, the stratigraphy and foliation trend predominantly east to west. Mafic metavolcanic rocks of the Western Volcanic subdomain dip northward along a disconformable contact with the south-dipping younger sediments of the Eastern Volcanic subdomain. This disconformity can be traced northwest through Desbiens Township and westerly through the north parts of Olsen and Davieaux townships. This contact disconformity is the plate collision thrust boundary (Figure 4) between the overthrusted Eastern Volcanic subdomain and the Western Volcanic subdomain (Grunsky 1991). This thrust zone is recommended as a favourable area for prospecting for gold mineralization. Recent construction of logging roads by Wagner Ontario Forest Management provides enhanced access to the area.

Grunsky (1991) identified a large, Y-shaped central core of greenschist-facies metamorphism in the central portion of the Batchawana greenstone belt, surrounded by rocks of lower to middle amphibolite metamorphic grade. Transition zones between the 2 metamorphic facies trend westerly through the north parts of Olsen and Davieaux townships and northwesterly through Desbiens, Vibert, Way-White, Running and Runalls townships. Greenschist facies to amphibolite facies metamorphic transition has been recognized as a favourable environment for gold mineralization within Archean rocks.

Late Archean metasedimentary rocks intruded by post-kinematic felsic rocks are exposed in Raafluab, Runalls, Way-White, Vibert, Tronsen, Desbiens and the north parts of Olsen and Davieaux townships. Ages obtained for the late tonalitic to granodioritic intrusions spans 2668 to 2678 Ma. This extensive sedimentary accumulation has been described as an island-arc sequence. Iron formation occurrences in the area appear to be small and scattered in distribution. Nevertheless, Siragusa (1986) points out that his experience in the "Hemlo belt" has shown that iron formation, as well as bands of rusty interflow clastic sediment, can host significant gold values. Areas of deformation of metasedimentary rocks in response to emplacement of late felsic intrusions in Vibert, and Tronsen townships, and the west side of Way-White and the north part of Davieaux townships were recommended as favourable areas for gold mineralization by Siragusa (1986).

Previous exploration in the area included diamond drilling as recently as 1995 by Tri Origin Explorations Ltd. in Runalls Township, where gold mineralization is associated with 2 northwest-trending zones. Mineralization consists of stringers and irregular clots of pyrite and pyrrhotite and banded to massive pyritic and pyrrhotite iron formations hosted by sericitic and locally silicified clastic sedimentary rocks and felsic volcanic rocks (http://www.triorigin.com).

Between 1982 and 1988, Massive Energy Corporation conducted extensive exploration in Desbiens and Davieaux townships for gold mineralization associated with sulphide-facies ironstones.

Figure 4 Batchawana Greenstone Belt showing Grunsky's synclinal axis and deformation zone recomended for gold prospecting
The base for this map is the grey shaded 1:20,000 provincial airborne total field magnetics

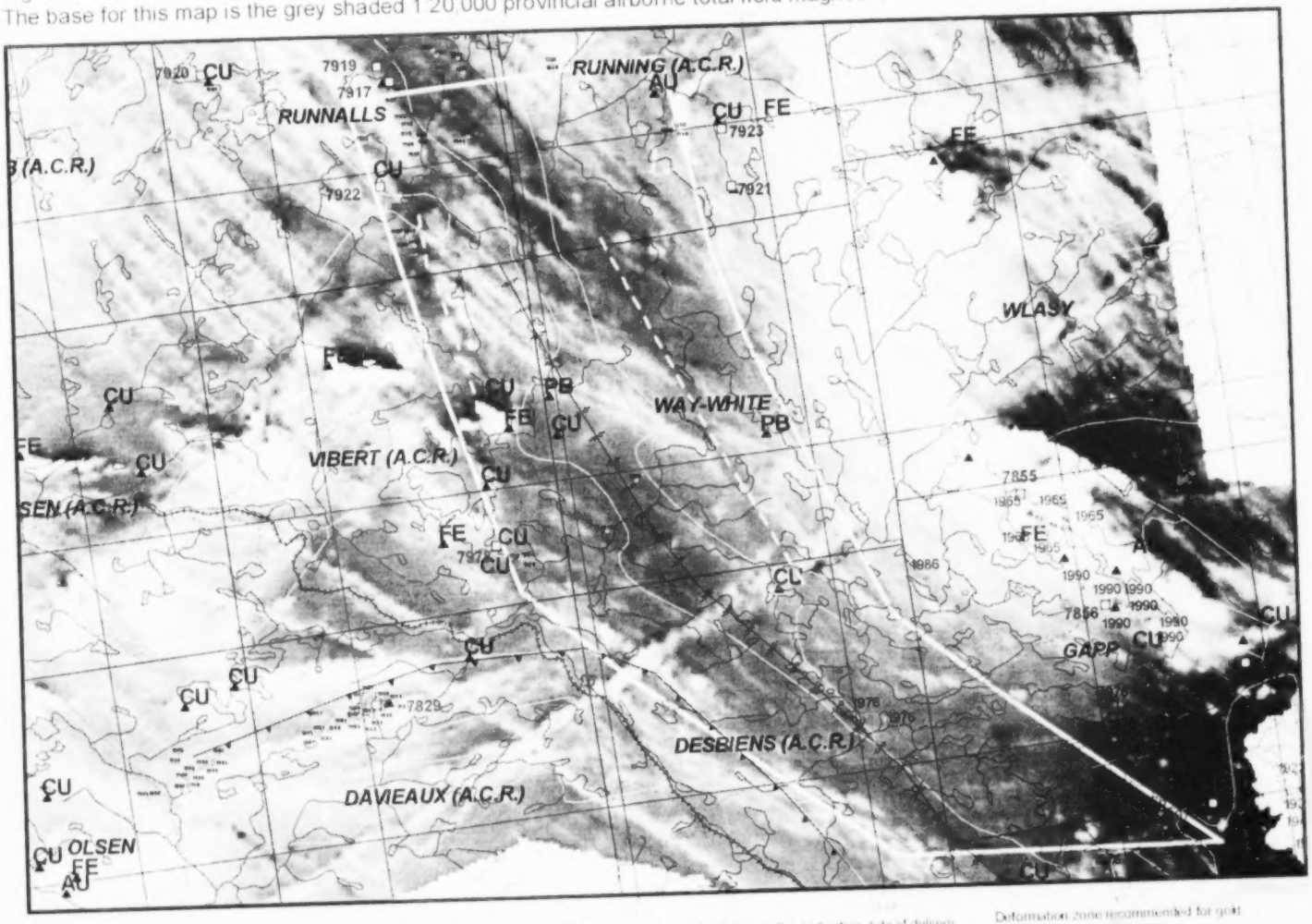

Figure 4. Batchawana Greenstone Belt showing Grunsky's synclinal axis and deformation zone recomended for gold prospecting. The base for this map is the grey shaded 1:20,000 provincial airborne total field magnetics.

IRON OXIDE-COPPER-GOLD (IOCG) EXPLORATION TARGETS IN THE SAULT STE. MARIE DISTRICT

The Sault Ste. Marie area is currently undergoing exploration for IOCG targets in 2 rift environments on the margins of the Superior Archean craton. Early Proterozoic sedimentary rocks of the Huronian Supergroup crop out along the north shore of Lake Huron, and Late Proterozoic Mid-Continent Rift-related volcanic and sedimentary rocks of Keweenawan age are exposed along the east shore of Lake Superior. Albitization of the Huronian rocks has an age of 1.7 Ga, which was determined by Schandl and Gorton (1993), who suggest that elevated REE minerals associated with albitized Huronian metasediments infer that carbonatitic or alkaline intrusions at depth may have generated sodium-rich fluids. Over 120 copper, polymetallic and/or precious metals occurrences are documented within the Huronian Basin. Most occurrences are structurally controlled, sulphide bearing, quartz-carbonate veins and breccias. Albitization, or soda metasomatism, and hematization accompany many of these vein and breccia-type deposits.

The Mid-Continent Rift was proposed as a suitable environment for IOCG deposits at a workshop convened by the United States Geological Survey in 1988 (Pratt and Sims 1990). Late subvolcanic, felsic rocks intrude mafic, subaerial basaltic flows along the east shore of Lake Superior in Keweenawan-age rocks. Red-bed, arkose sandstones and siltstones overlie the igneous rocks in an angular unconformity. Felsic intrusive rocks are frequently associated with breccia pipes. Other features of these subvolcanic, felsic intrusives include ± soda metasomatism, ± hematization ± fluorite and copper mineralization ± precious metals. At the Island Lake Copper prospect, located 15 km north of Sault Ste. Marie, extensive brecciation and soda metasomatism surround massive hematite breccia zones hosting auriferous chalcopyrite mineralization.

Exploration techniques currently being employed to look for IOCG deposits in the Sault Ste. Marie District include diamond drilling, compilation of geographic information system (GIS) data, magnetic and ground gravity surveys combined with geological on-site inspections, geological mapping and sampling.

Two companies have tested targets with diamond drilling. Amerigo Resources Ltd. and Intrepid Minerals Corporation, each having a joint venture agreement with Falconbridge Exploration (*see* "Amerigo Resources Ltd – Iron Oxide-Copper-Gold Mineralization at the Island Copper and Coppercorp Mine" and "Intrepid Minerals Corporation and Falconbridge Limited").

Mesoproterozoic intrusive rocks have been documented intruding Archean granite gneiss and supracrustal rocks of the Batchawana greenstone belt, marginal to the Proterozoic rift-related basins. IOCG-style mineralization may be present in the older Archean rocks, in association with Mesoproterozoic intrusive rocks.

Table 4. Publications received by the Sault Ste. Marie District Office in 2002.

Title	Author	Type and Year of Publication
Summary of Field Work and Other Activities, 2002	Baker, C.L., Debicki, E.J., Kelly, R.I. and Parker, J.R. (eds.)	OGS OFR 6100, 2002
Report of Activities 2001, Resident Geologist Program, Red Lake Regional Resident Geologist Report: Red Lake and Kenora Districts	Lichtblau, A., Hinz, P., Ravnaas, C., Storey, C.C., Kosloski, L. and Raoul, A.,	OGS OFR 6079, 2002
Report of Activities 2001, Resident Geologist Program, Thunder Bay North Regional Resident Geologist Report: Thunder Bay North District	Mason, J.K., White, G.D., Scott, J.F., O'Brien, M.S. and Komar, C.	OGS OFR 6080, 2002
Report of Activities 2001, Resident Geologist Program, Thunder Bay South Regional Resident Geologist Report: Thunder Bay South District	Schneiders, B.R., Scott, J.F., Smyk, M.C., Parker, D.P. and O'Brien, M.S.	OGS OFR 6081, 2002
Report of Activities 2001, Resident Geologist Program, Timmins Regional Resident Geologist Report: Timmins and Sault Ste. Marie Districts	Atkinson, B.T., Hailstone, M., Seim, G. Wm., Draper, D.M., Farrow, D. and Hope, P.	OGS OFR 6082, 2002

Title	Author	Type and Year of Publication
Report of Activities 2001, Resident Geologist Program, Kirkland Lake Regional Resident Geologist Report: Kirkland Lake and Sudbury Districts	Meyer, G., Cosec, M., Grabowski, G.P.B., Guindon, D.L., Chaloux, E.C. and Stewart, J.M.	OGS OFR 6083, 2002
Report of Activities 2001, Resident Geologist Program, Southern Ontario Regional Resident Geologist Report: Southeastern and Southwestern Districts, Mines and Minerals Information Centre and Petroleum Resources Centre	Sangster, P., McGuinty, W.J., Papertzian, V.C., Steele, K.G., Lee, C.R., Laidlaw, D.A., Barua, M., Carter, T.R. and Parkes, B.D.	OGS OFR 6084, 2002
Report of Activities 2001 Resident Geologist Program, Regional Land Use Geologist Report: Northwestern, Northeastern and Southern Ontario Regions	Debicki, R.L., Drost, A.P., Rowell, D.J. and Yule, G.R.	OGS OFR 6085, 2002
Aggregate Resources Inventory of the Echo Lake to Batchawana Bay area	Rowell, D.J.	OGS Aggregate Resources Inventory Paper 176, 2002
Iron oxidation state of a 2.5 b.y.-old paleosol developed on mafic volcanics: implication on atmospheric oxygen	Utsunomiya, S., Murakami, T., Nakada, M. and Kasama, T.	Geochimica et Cosmochimica Acta, v.67, p.213-227 (preprint received 2002)
Hydrothermal iron oxide copper-gold & related thermal deposits: a global perspective	Porter, T.M. (ed.)	Australian Mineral Foundation Inc., 2001
Biotitization of vermiculite under hydrothermal condition	Murakami, T., Kasama, T. and Sato, M.	Journal of Mineralogical and Petrological Sciences, v.97, p.263-268, 2002

Table 5. Mineral deposits not being mined in the Sault Ste. Marie District in 2002.

Abbreviations

AF.....Assessment Files
CMH.....Canadian Mines Handbook
GR.....Geological Report
MDC.....Mineral Deposits Circular [No.15–] [*formerly* Mineral Resources Circular, No.1-14]
MDIR.....Mineral Deposit Inventory Record
MLS.....Mining Lands, Sudbury
MR.....Geological Survey Canada Publication
NM.....The Northern Miner
OFR.....Open File Report
PC.....Personal Communication

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Pater Mine Spragge Tp. 41J/2	Cu, Au, Ag	936 670 T @ 1.8% Cu	Rio Algom Limited	MR 1087	Past Producer 1969-1970
Bar-Fin Mine Thompson Tp. 41J/3	Cu	1906 - 130 foot shaft with 250 feet lateral work	Staked	MR 1087	Past Producer 1906
Bald Dome Prospect Plummer Add. Tp. 41J/5	Cu	680 388 T @ 0.25% Cu		MR 1087	Inactive
Bruce Mines Plummer Add. Tp. 41J/5	Cu, Ag	40 000 T @ 1.8% Cu above 155-foot level		MDC 12	Past Producer 1915-1921
Campbell–Dukes Prospect Plummer Add. Tp. 41J/5	Cu	33 000 T @ 1.2% Cu in 230' by 8' by 220' block		MR 223	Past Producer 1956
Rock Lake Mine Aberdeen Tp. 41J/5	Cu, Ag	1898-1903: 420 foot shaft with 3 levels and 606 lateral development		MDC 12	Past Producer 1901-1903

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Havilah Mine – Ophir Mine Galbraith Tp. 41J/5	Au, Ag, Cu	1 main vein, 2 – 150 foot shafts, 1 – 183 foot adit		MDC 12	Past Producer 1892-1922
Steinberg Mine Plummer Add. Tp. 41J/5	Cu	47 000 T @ 1.82% Cu or 124 000 T @ 1.1% Cu (drill indicated)		AF	Past Producer 1906 & 1956
Stobie Mine – Rainbow Mine Johnson Tp. 41J/5	Cu, Ni, Au	9 T of ore shipped from 1 – 160 foot shaft with 20 feet of lateral workings		MDC 12	Past Producer 1899-1901
Bilton Option Patton Tp. 41J/6	Cu	453 593 T @ 1.7% Cu	N/A	MR 1087	Past Producer Pre 1956
Boyea Lake Adit and East Zones Montgomery Tp. 41J/6	Cu	Adit Area - 128 000 T @1.95% Cu probable & possible to 200 feet; East Area - 56 500 T @ 2.98% Cu drill indicated to 250 feet	N/A	Sudbury Contact Mines AR 1971	Past Producer Pre-1942
Crownbridge (Cannon) Prospect Kamichisitit Tp. 41J/6	Cu	415 000 T @ 1.8% Cu diluted grade	N/A	MDC 12	Past Producer 1966-1967
Glagoma Mine Gladstone Tp. 41J/6	Cu	1917 2 shafts sunk to 250 feet		MDC 12	Past Producer 1917 & 1962
Goulding Mine Cobden Tp. 41J/6	Cu	1962 816 T @ 1.4% Cu shipped from mine		MDC 12	Past Producer 1962
North Montgomery-Grand Portage Mine Montgomery Tp. 41J/6	Cu	147 677 T @ 1.7% Cu – Main Zone 40 9000 T @ 1.96% Cu – No 1 Zone 77 063 T @ 3.23% Cu – No 2 Zone 61 688 T @ 1% Cu – West Zone	N/A	MR 1087	Inactive
Milgate (Abbican) Prospect Nouvel Tp. 41J/6	Cu	95 934 T @ 1.08% Cu (drill indicated) A Zone L-600' by W-10' by D-235'		MR 1087	Inactive
Principle Strategic Minerals Prospect Gladstone Tp. 41J/6	Cu	112 300 T @ 1.54% Cu (drill indicated)		NM MDC 12	Inactive
Sheba Prospect Nouvel Tp. 41J/6	Cu	L-1000' by W-3' on surface @ 0.59% Cu	N/A	MDC 12	N/A
Twin Lakes Prospect Esten Tp. 41J/7	Cu	Probable - 76 900 T @ 1.73% Cu over 8.04 feet	N/A	MDC 12	
Bi-Ore Mine Sagard Tp. 41J/10	Cu	13 607 T @ 6% Cu	N/A	MR 1087	Past Producer 1947-1949
Cheney Mine Gould Tp. 41J/11	Cu	39 405 T @ 3.97% Cu (drill indicated)	N/A	MDC 12	Past Producer 1966-1967
Copper Prince Mine Kamichisitit Tp. 41J/11	Cu, Au	45 359 T @ 3% Cu 4 ore shoots near surface		MR 1087	Past Producer 1972
Jardun Mine Jarvis Tp. 41K/9	Pb, Zn, Ag, Cu, Au	49 367 T @ 4.4% Pb, 3.1% Zn, 1.42 oz/T Ag	N/A	MDC 12	Past producer 1954-1957

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Kerr Scott Deroche Tp. 41K/9	Pb, Zn, Ag, Au	1859 T of hand-cobbed ore recovered. Deposit reserves have not been calculated		MDC 12	Past Producer 1939
Goulais River VanKoughnet Tp. 41K/11	Cu, Ag	250 000 T @ 2.35% Cu, 0.26 oz/T Ag in 3 zones (drill-indicated)	N/A	MR 223	Past Producer 1975 & 1981
Kristina Mine LaVerendrye Tp. 41K/11	Cu	369 350 T @ 1.95% Cu in No 4 and No. 6 shaft zones	N/A	MDC 12 MR 223	Past producer 1903-1907
Prace–Sill Lake Mine VanKoughnet Tp. 41K/16	Pb, Zn, Ag	340 T Pb, Ag concentrate produced Deposit reserves have not been calculated	N/A	PC	Past Producer 1981 & 1985-1987
Caputo–Just Wishart Tp. 41N/1	Cu	475 T @ 11.18 % Cu recovered from 3 zones		MDC 12	Past Producer 1968
Coppercorp Mine Ryan Tp. 41N/2	Cu, Ag, Au	1 360 777 T @ 1.7% Cu in C Zone 362 873 T @ 2.3% Cu in C-2 Zone 589 670 T @ 2.1% Cu in SB Zone 444 520 T @ Cu in Silver Creek Zone	N/A	MR 1087	Past Producer 1964-1972 1 M Tons recovered
Glenrock Palmer Tp. 41N/2	Co, Au, Cu	Several zones – main zone L-250' by W-3.5' (drill indicated)		MR 1087 MDC 12	
Jogran Prospect Ryan Tp. 41N/2	Cu, Mo	L-600' by W- 400' by D-680' @ 0.053% MoS_2, 0.19% Cu (drill indicated)		MDC 12 MR 223	
Mamainse Mine Ryan Tp. 41N/2	Cu	Vein L-1500' by W-13' 3 shafts sunk to depth 60, 280, 1500 feet		MDC 12	Past Producer 1882-1884
Maricona Prospect Slater Tp. 41N/2	Cu	267 986 T @ 1.17% Cu reserves in 3 sections		MDC 12	
Pancake Lake Kincaid Tp. 41N/2	Cu	L-300' by W-21.5' by D-200' @ 0.76% Cu (drill indicated)		MR 1087	
Tribag Mine Nicolet Tp. 41N/2	Cu, W, Ag, Au	2 267 961 T @ 1.6% Cu – Breton Zone 113 397 092 T @ 0.13% Cu, 0.27% Mo – East Breccia Zone 429 688 T @ 1.6% Cu – West Breccia 929 864 T @ 2.3% Cu – H Zone 907 184 T @ 0.2% W in Tailings – H Zone	Channel I	MR 1087 MDC 12	Past Producer 1967-1973 Production from Breton & West Breccia Zones

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Metric Conversion Table

Conversion from SI to Imperial			Conversion from Imperial to SI		
SI Unit	*Multiplied by*	*Gives*	*Imperial Unit*	*Multiplied by*	*Gives*
		LENGTH			
1 mm	0.039 37	inches	1 inch	**25.4**	mm
1 cm	0.393 70	inches	1 inch	**2.54**	cm
1 m	3.280 84	feet	1 foot	**0.304 8**	m
1 m	0.049 709	chains	1 chain	20.116 8	m
1 km	0.621 371	miles (statute)	1 mile (statute)	**1.609 344**	km
		AREA			
1 cm^2	0.155 0	square inches	1 square inch	**6.451 6**	cm^2
1 m^2	10.763 9	square feet	1 square foot	**0.092 903 04**	m^2
1 km^2	0.386 10	square miles	1 square mile	2.589 988	km^2
1 ha	2.471 054	acres	1 acre	0.404 685 6	ha
		VOLUME			
1 cm^3	0.061 023	cubic inches	1 cubic inch	**16.387 064**	cm^3
1 m^3	35.314 7	cubic feet	1 cubic foot	0.028 316 85	m^3
1 m^3	1.307 951	cubic yards	1 cubic yard	0.764 554 86	m^3
		CAPACITY			
1 L	1.759 755	pints	1 pint	0.568 261	L
1 L	0.879 877	quarts	1 quart	1.136 522	L
1 L	0.219 969	gallons	1 gallon	**4.546 090**	L
		MASS			
1 g	0.035 273 962	ounces (avdp)	1 ounce (avdp)	28.349 523	g
1 g	0.032 150 747	ounces (troy)	1 ounce (troy)	**31.103 476 8**	g
1 kg	2.204 622 6	pounds (avdp)	1 pound (avdp)	**0.453 592 37**	kg
1 kg	0.001 102 3	tons (short)	1 ton (short)	**907.184 74**	kg
1 t	1.102 311 3	tons (short)	1 ton (short)	**0.907 184 74**	t
1 kg	0.000 984 21	tons (long)	1 ton (long)	**1016.046 908 8**	kg
1 t	0.984 206 5	tons (long)	1 ton (long)	**1.016 046 90**	t
		CONCENTRATION			
1 g/t	0.029 166 6	ounce (troy)/ ton (short)	1 ounce (troy)/ ton (short)	34.285 714 2	g/t
1 g/t	0.583 333 33	pennyweights/ ton (short)	1 pennyweight/ ton (short)	1.714 285 7	g/t

OTHER USEFUL CONVERSION FACTORS

	Multiplied by	
1 ounce (troy) per ton (short)	31.103 477	grams per ton (short)
1 gram per ton (short)	0.032 151	ounces (troy) per ton (short)
1 ounce (troy) per ton (short)	20.0	pennyweights per ton (short)
1 pennyweight per ton (short)	0.05	ounces (troy) per ton (short)

Note: Conversion factors which are in bold type are exact. The conversion factors have been taken from or have been derived from factors given in the Metric Practice Guide for the Canadian Mining and Metallurgical Industries, published by the Mining Association of Canada in co-operation with the Coal Association of Canada.

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